

ISSN: 0974-6358 (P)
ISSN: 2583-3251 (O)

PEOPLE'S JOURNAL OF SCIENTIFIC RESEARCH

AN INDEXED JOURNAL

VOLUME 16 ISSUE 2

July-Dec 2023



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Leishmaniasis: An Emerging slow threat in Central Kerala-A Case Series

Rini Raveendran¹, Kavya Karunakaran², Jyothi Chelakara Ramaswamy³, Reimol Jose⁴, Rajesh KR⁵, Akshay Hareesh¹

¹Department of Community Medicine, Government Medical College, Thrissur, Kerala, India, ²Deputy DMO-Thrissur, DHS, Kerala State, ³Department of Pathology, GMC, Alappuzha, ⁴Department of Pathology, GMC, Ernakulam, ⁵Department of General Medicine, GMC, Thrissur, India.

ABSTRACT:

Background- Leishmaniasis is among one of world's most neglected diseases affecting the poorest of the poor, mainly in developing countries. This sandfly-borne diseases is caused by more than 20 species of the protozoan genus Leishmania.

Materials & Methods- A Record based retrospective observational study- Case series was conducted at a tertiary care centre in Central Kerala. All records were collected from the Departments of Pathology and Dermatology, Govt Medical College, Thrissur and from District Malaria Office, Thrissur of patients who were diagnosed as leishmaniasis and the records were analyzed to verify the secondary data. 16 cases were obtained from the records.

Results- Majority (69%) were males with most cases in their 4th decade of life at the time of diagnosis. Even non endemic area such as Thiruvananthapuram district has reported Leishmaniasis. HIV co-infection was present in one patient with visceral leishmaniasis.

Conclusion- As Kerala is an area not previously reported to be an endemic focus for Leishmaniasis, most often the disease is misdiagnosed. Kala-azar may also be under reported in Kerala. In order to seek attention regarding Leishmaniasis at the earliest point of contact with the health department, training of the health care providers regarding the disease is crucial. This can help to develop a high level of clinical suspicion in diagnosing this disease in its early stage itself.

KEY WORDS: Leishmaniasis, Case series, Kerala, Thrissur

Address for correspondence : Dr. Rini Reveendran, Professor (CAP), Department of Community Medicine, Government Medical College, Thrissur, Kerala, India , E-mail: rinisujay@gmail.com

Submitted: 19.06.2023, **Accepted:** 10.08.2023, **Published:** 18.12.2023

INTRODUCTION:

Leishmaniasis is among one of world's most neglected diseases affecting the poorest of the poor, mainly in developing countries. This sandfly-borne disease caused by more than 20 species of the protozoan genus Leishmania appears in three basic clinical forms according to the location of parasites in mammalian tissues: visceral, cutaneous and mucocutaneous leishmaniasis. Visceral leishmaniasis is the most serious form, and is potentially fatal if untreated^[1]. Globally, around 350 million people are at

risk of infection and disease, and there are an estimated 1.5–2 million new cases, with 70,000 deaths each year. In India, the disease is endemic in Thar desert of Rajasthan and certain parts of Gangetic plains; however, new endemic zones are being reported within and outside these regions as well^[2].

The visceral form of the disease is still endemic in India in the states of Bihar, West Bengal, Jharkhand & Uttar Pradesh^[3]. Two cases of cutaneous leishmaniasis (CL) were reported in Kerala for the first time in 1988 in Thiruvananthapuram^[4].

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How to cite this article: Raveendran R, Karunakaran K, Ramaswamy JC, Jose R, Rajesh KR, Hareesh A. Leishmaniasis: An Emerging slow threat in Central Kerala- A Case Series. PJSR. 2023;16(2):1-4.

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Quick Response Code:



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doi.org/10.5281/zenodo.10400797

Kala-Azar is rare in South India, and there are no previous reports of visceral leishmaniasis from Kerala. Two cases of visceral leishmaniasis were reported from Kerala residing in Desamangalam and Palappilly near the forest, more than 75 km apart; who have never been out of Kerala^[5]. Kollam, a district of Kerala reported Two cases of visceral leishmaniasis in February 2016 and in June 2018. Epidemiological analysis indicated no epidemiological link between the cases^[6].

RATIONALE:

This record based case series highlights the emerging predominance of Leishmaniasis in Kerala and the clinical types who sought treatment at the tertiary care centre in Central Kerala for more than a decade.

MATERIALS & METHODS:

A retrospective record based case series - observational study was conducted at Govt Medical College, Thrissur comprising of records retrieved from 2000-2012. The study had obtained institutional ethical committee approval. 16 records were retrieved from Government Medical College Thrissur, a tertiary care centre in Central Kerala as part of an investigation of Leishmaniasis. All records were collected from the Departments of Pathology and Dermatology, Government Medical College and District Malaria Office, Thrissur regarding patients who were diagnosed with leishmaniasis and the records were analyzed to verify the secondary data. Their demographic factors were considered. For confirming the diagnosis of Visceral leishmaniasis, Bone Marrow Trephine had been taken and for cutaneous leishmaniasis, skin biopsy had been taken as sample.

RESULTS:

A total of 16 cases were obtained from the records. The epidemiological factors were considered. Majority (69%) were males and belonged to the age group 26-50 years [Table 1]. Mainly reported cases were native i.e; Thrissur. Lupus Vulgaris (n=2), Hansen Disease (n=2), Squamous Cell Carcinoma of Buccal mucosa (n=2), Fungal Infections (n=2) were recorded as cutaneous manifestations while Hematological Malignancy (n=3), Pancytopenia Under Evaluation (n=2), Pyrexia of Unknown Origin (n=2), Sarcoidosis /NHL (n=1) were recorded as visceral manifestations [Table 2]. Our results showed that 2 patients expired while 4 patients got better [Table 3]. Most of the cases were in their 4th decade of life at the time of diagnosis. Sporadic occurrence was seen.

Table 1: Distribution of cases based on epidemiological profile.

Year	Number of Cases
2000	1
2003	1
2004	1
2005	1
2006	3
2008	1
2010	1
2011	2
2012	3
unknown	2
Age at Diagnosis	
<25 yrs	3
26-50 Yrs	13
Gender	
Male	11
Female	5
Place of Residence	
Thrissur	7
Palakkad	7
Idukki	1
Unknown(Assam*)	1
Type of admission	
Inpatient	7
Outpatient	6
unknown	3
Department Consulted	
Dermatology	8
Medicine	5
Paediatrics	3
Diagnosis of type of Leishmaniasis	
Visceral	8
Cutaneous	8
Concomitant infection(HIV)	
Yes	1
No	15
Treatment given	
Amphotericin B	2
Liposomal AMB	1
unknown	13

*NB: *A patient from Assam—the whereabouts of local residence was not revealed.*

Table 2: Distribution based on clinical diagnosis of Leishmaniasis.

Clinical Diagnosis	No of Cases
Cutaneous Leishmaniasis	
Lupus Vulgaris	2
Hansen Disease	2
Squamous Cell Carcinoma of Buccal mucosa	1
Fungal Infection	1
Leishmaniasis	2
Visceral Leishmaniasis	
Hematological Malignancy	3
Pancytopenia Under Evaluation	2
Pyrexia of Unknown Origin	2
Sarcoidosis /NHL	1

Table 3: Distribution based on follow up of Leishmaniasis.

Followup	No of Cases
Expired	2
Symptomatically better	4
Loss to Follow up	10

Both cutaneous as well as visceral leishmaniasis occurred sporadically in Kerala.

DISCUSSION:

In our study the predominant age group was 26-50 years unlike in other study which was below 20 years of age^[9]. In our study visceral leishmaniasis has been reported along with HIV as co-infection in a migrant hailing from Assam, residing at Malappuram which was similar to a report by Chandran P in 2016 when two indigenous cases of visceral leishmaniasis were reported from Malappuram district of Kerala^[3,6] and a case report in 2003^[5]. A study from Ernakulam could not find any persons affected with Leishmaniasis among the migrant population unlike our study^[10].

Our study has also reported cutaneous leishmaniasis which is similar to studies done by Simi et al which reported Cutaneous Leishmaniasis from persons residing in the Mele Aamala and Aayiramkala forest tribal settlements in Kuttichal Panchayat of Thiruvananthapuram district^[4]. Similarly Lohitdasan and Muhammed K in 1988 reported two imported cases of cutaneous leishmaniasis from Trivandrum in 1988 followed by the first indigenous case of cutaneous leishmaniasis from Malappuram district after 2 years^[7,8].

CONCLUSION:

As Kerala is a state- not previously reported to

be an endemic focus for Leishmaniasis, most often the disease is misdiagnosed. Moreover, as it is being reported sporadically only, it may also be under-reported in Kerala. In order to give proper management regarding Leishmaniasis at the earliest point of contact with the health department, training of the health care providers is crucial. This can help to develop a high level of clinical suspicion in diagnosing thereby detecting the disease in its early stage itself.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

ACKNOWLEDGMENT:

Dr Joy Augustine, HOD Pathology, AIMS, Thrissur and DMO Thrissur officials for the whole hearted support.

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Research Article

Prevalence, knowledge and attitude of Tobacco Habit and cessation Among Taxi Drivers in Mumbai

Siddhesh Snehal Birje¹, Swati Shrikant Gotmare¹, Treville Pereira¹, Subraj Shetty¹, Siddharth Acharya², Mayura Chande¹

¹Department of Oral Pathology and Microbiology, DY Patil University School of Dentistry, Navi Mumbai, India, ²Department of Public Health Dentistry, DY Patil University School of Dentistry, Navi Mumbai, India

ABSTRACT:

Background- India has the highest incidence of oral cancer worldwide. Despite all the efforts, tobacco smoking is a serious health problem in India, where one-third of the population smokes. The aim of this article is to assess knowledge about awareness regarding tobacco cessation policies, harmful effects of tobacco among taxi drivers in Mumbai.

Materials & Methods- A questionnaire-based study was designed wherein 139 cab drivers from the Dadar neighbourhood participated.

Results- Participants in this study were between 24 to 70 age ranges. 60% of the participants used cigarettes, whereas 73% were unaware of the government's smoke cessation policies. Despite several policies available, the majority of cigarette users were ignorant of them.

Conclusion- We concluded in our study that most participants were aware of the harmful effects of tobacco. They knew nothing about cessation clinics. We also learned that even after being put into place, the tobacco cessation policies were not socially promoted.

KEYWORDS: tobacco, tobacco cessation centres, tobacco cessation policies, health survey

Address for correspondence : Dr Swati Shrikant Gotmare, Professor, Department of Oral Pathology and Microbiology, DY Patil University School of Dentistry, Sector 7, Nerul, Navi Mumbai-400706, India, E-mail: swatishrikant2003@gmail.com

Submitted: 26.06.2023, **Accepted:** 09.09.2023, **Published:** 26.12.2023

INTRODUCTION:

Since the dawn of history, food and tea, as well as tobacco, have been linked to mankind. Gately has provided a detailed account of its historical roots and how it later ingratiated itself into contemporary culture^[1]. Over the past ten years, research on tobacco carcinogenesis has persisted, and a variety of epidemiological and experimental studies have confirmed that exposure to tobacco smoke plays a significant role in acquiring lung and bladder cancers, as well as other cancers of the oral cavity, oesophagus, colon, pancreas, breast, larynx, and kidney. Additionally, it has been linked to leukaemia, particularly acute myeloid leukaemia^[2].

The annual death toll from tobacco usage is close to six million. Approximately 100 million premature deaths worldwide were attributed to tobacco use in the 20th century, according to estimates from the World Health Organisation (WHO), and if present tobacco consumption trends continue, this number is anticipated to increase to 1 billion in the 21st^[3]. Each component of the body is impacted by tobacco. The prevalence of cancer, TB, respiratory illnesses, and cardiovascular disorders is relatively high in India. Oral cancer is noteworthy in this context; India has the highest incidence of oral cancer worldwide^[4]. Controlling tobacco should be a primary goal, both for

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doi.org/10.5281/zenodo.10431969

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तंबाखू मुक्ती सर्वेक्षण

- ०१) तुम्ही कोणतेही तंबाखू उत्पादन वापरता का?
हो ☐ नाही ☐
- ०२) तुम्ही कोणत्या प्रकारचे तंबाखू उत्पादन वापरता?
सिगारेट ☐ धूरविरहित ☐ तंबाखू ☐ गुटखा ☐ मशोरी ☐ इतर _____
- ०३) (सिगारेट / तपकीर / तंबाखू) यांपैकी तुम्ही किती वापरता?

- ०४) सकाळी उठल्यानंतर तुम्ही किती वेळात तंबाखू वापरता?

- ०५) तुमच्या घरातील किती माणसे तंबाखू वापरतात?

- ०६) तुम्ही प्रथम तंबाखू वापरला तेव्हा तुम्ही किती वर्षाचे होतात?

- ०७) तुम्ही किती वर्षे तंबाखू वापरत आहात?

- ०८) तंबाखूच्या घातक परिणामाबद्दल तुम्हाला काही माहिती आहे का?

- ०९) तुमच्या तोंडात तुम्हाला काही अनियमित बदल दिसले का? (पांढरा लाल चट्टा)

- १०) तंबाखू व्यातिरिक्त तुम्हाला दुसरे काही व्यसन आहे का?
होय ☐ नाही ☐
- ११) तुम्हाला तंबाखूचे व्यसन सोडवायचे आहे का?

- १२) तुम्हाला कोणत्या प्रमुख कारणासाठी तंबाखूचे व्यसन सोडवायचे आहे?
मुख दुर्गंधी ☐ कुटुंब ☐ व्यसन ☐ सामाजिक कारणे
- १३) पुर्वी तुम्ही किती वेळा तंबाखूचे व्यसन सोडण्याचा प्रयत्न केला आहे?

- १४) तुम्हाला कोणत्याही तंबाखू बंदीच्या कार्यक्रमाबद्दल माहिती आहे का?

- १५) तुम्ही खालीलपैकी कोणत्याही गोष्टीचा प्रयत्न केला आहे?
ॲक्युपॅन्सर ☐ निकोटीन पॅच ☐ निकोटीन गम्स ☐ नाकाचे स्त्रे ☐ संमोहन ☐ काही नाही
- १६) तुम्हाला तंबाखू बंदीच्या क्लासला उपस्थित राहण्यात रस आहे का?

Figure 1: Sample questionnaire in marathi language.

health reasons and as a means of reducing poverty. India has the opportunity to realise its pledges to meet the 2030 Sustainable Development Goals of poverty reduction and good health by effectively implementing tobacco control measures. Despite all the efforts, tobacco smoking is a serious health problem in India, where one-third of the population smokes^[5]. It is also vital to examine the tobacco epidemic and assess governing policies in order to give focused intervention^[6]. The National Family Health Survey (NFHS-3) study, carried out in 2005–2006, found that tobacco smoking is more common among men, rural residents, illiterates, impoverished people, and other vulnerable groups^[7]. The rising use of tobacco in developing nations is mostly due to a lack of knowledge about the possible issues and clear health risks connected with smoking, as well as tobacco industry strategies that target the most vulnerable demographics, such as women and young people^[8]. The aim of this paper is to assess knowledge about awareness regarding tobacco cessation policies among taxi drivers in Mumbai, awareness about the harmful effects of tobacco & to find out the number of active tobacco users & non tobacco users. This study could also gain information about the tobacco consumption habits & reason for excess use of tobacco products and willingness to reduce or stop the tobacco consumption habits.

MATERIALS & METHOD:

A questionnaire-based study was designed in our institute. The study was approved by institutional ethical committee. A short questionnaire was given to willing taxi drivers in order to gather this information through a verbal and record-based analysis. The questionnaire was written in an easy-to-understand fashion. People had the option to choose their preferred language from a list of three (English, Hindi, and Marathi) when filling out the questionnaire [Figure 1].

139 cab drivers from the Dadar neighbourhood participated. Each participant understood the purpose of the study. Participants were informed of how the department of oral and maxillofacial pathology used all the data for research purposes. All participants were made aware that the research's findings would never be shared with them. The subject or future individuals who are similar to him would gain directly from this study. The complete amount of data was evaluated, and factors were used to compare the number of smokers and non-smokers overall. This information on the cab drivers' relatives gives a thorough understanding of the history of tobacco use in the family. Study solely included the taxi driver community. All the participants were male

and younger than 70 years old.

INCLUSION CRITERIA:

1. All willing participants who used tobacco in any form.
2. Only taxi drivers were included.

EXCLUSION CRITERIA:

1. Unwilling patients were excluded.

RESULTS:

From the whole Mumbai region, 139 taxi drivers actively engaged in the survey. Participants in this poll ranged in age from 24 to 70. The study's findings indicate that out of 139 sample participants, 84 of them are tobacco consumers and 55 of them are not [Figure 2]. 60% of the participants reported using cigarettes. We deduced that 73% of them were unaware of the government's smoke cessation policies and 37% were aware [Figure 3]. Every participant was ready to give up their smoking habit. According to the poll, the majority of smokers were considering participating in a cigarette cessation programme. Additionally, the history of tobacco use in the participants' relatives is learned through the survey. Regarding the taxi drivers' consumption patterns, no precise cause was identified. Bidi and guttka are the most common forms of tobacco consumption. In this study, we discovered that around 83% subjects who used tobacco were fully aware of its negative effects [Figure 4]. They were aware that smoking causes cancer and numerous other health issues. 37% of the tobacco users were aware of the policies for quitting the habit. Despite the fact that there are several policies available, the majority of cigarette users are unaware of them.

DISCUSSION:

The annual death toll from tobacco usage is close to six million. Approximately 100 million premature deaths worldwide were attributed to tobacco use in the 20th century, according to estimates from the World Health Organisation (WHO), and if present tobacco consumption trends continue, this number is anticipated to increase to 1 billion in the 21st^[3]. According to the GATS survey, there are 275 million tobacco smokers in India, or 35% of the adult population. 164 million people use smokeless tobacco, 69 million people smoke, and 42 million people use both smoking and smokeless tobacco^[9]. The International Agency for Research on Cancer's (IARC)

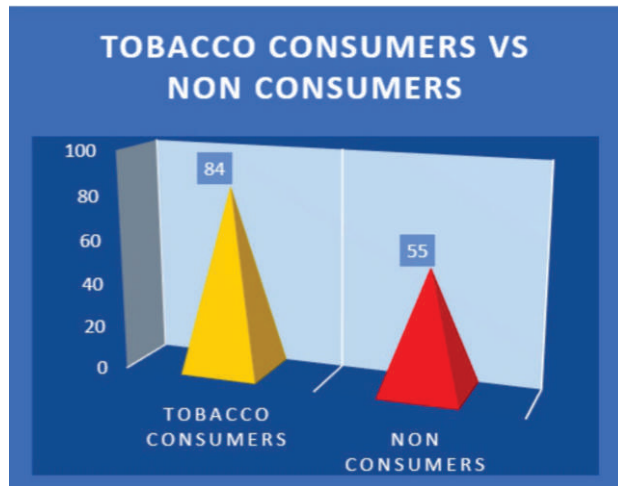


Figure 2: Number of tobacco consumers and non-tobacco consumers.

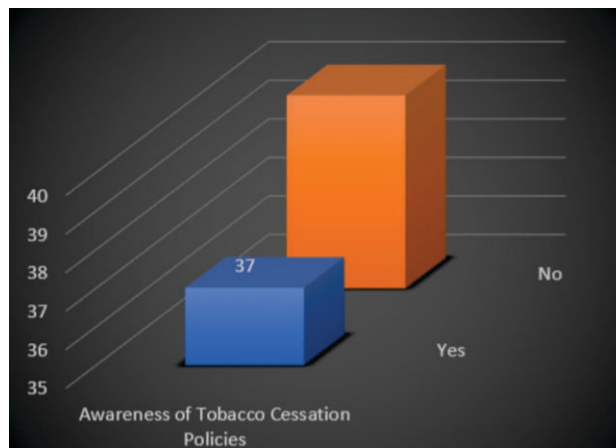


Figure 3: Percentage of aware vs unaware participants about government's smoke cessation policies.

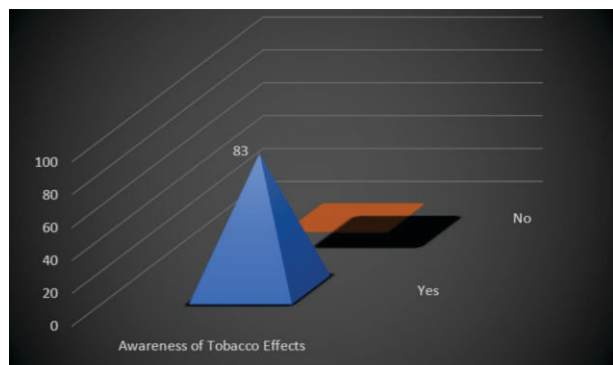


Figure 4: Percentage of participants aware vs non aware about harmful effects of tobacco.

monograph states that there is enough proof that smoking tobacco results in cancers of the lung, oesophagus, stomach, pancreas, kidney (body and pelvis), ureter, urinary bladder, uterine cervix, and bone marrow (myeloid leukaemia) in humans. Research on bidi smoking, the most popular type of tobacco use in

India^[10]. In Mumbai, smokers of bidis were 2.60 times more likely to die from tuberculosis than nonsmokers^[11].

Smoking tobacco can be done with beedis, cigarettes, hookas, hooklis, chhuttas, dhumtis, or chillums. Contrary to other western nations, smoking pipes and cigars is uncommon in India. In cities, smoking cigarettes is widespread. There are brands of cigarettes available that are made both locally and internationally. Since cab drivers regularly consume similar tobacco products, we chose to limit our sample to them. In a similar vein, this report reveals that the only products most frequently utilised are biddi and guttka. However, because cigarettes are more expensive than other tobacco products, they are more popular among upper and middle socioeconomic strata than among the underprivileged. Beedi is a low-cost smoking stick manufactured by rolling a rectangular piece of dried temburni leaf (*Diospyros melanaxylon*) into a conical form and securing it with a thread. A beedi can range in length from 4.0 to 7.5 cm. Small packets of beedis are sold in stores. These tobacco products are mostly used by cab drivers. In this study, we have noticed a pattern of tobacco use among taxi drivers who took part in the study. Tobacco is smoked using an indigenous contraption called a hooka, sometimes known as an Indian hubble bubble pipe. The tobacco smoke is passed through water that is stored in a sphere that may also include some aromatic compounds. Hooka smoking is a popular way for villagers to socialise, especially in India's northern and eastern regions, and it is a significant aspect of rural culture. Adults and older generations are more likely to use it. Teenagers are less likely to use it, though, as adults typically discourage the younger people from consuming hookah. In some regions of the country, people smoke tobacco using hookli, a little clay pipe-like device that is around 7 cm long. Reverse chhutta smoking involves inhaling smoke from a roll of tobacco (cheroot) that has been coarsely processed. In Andhra Pradesh, a province in southeast India, its use is common in coastal areas. Dhumti is a product that resembles a cigar that is manufactured by rolling tobacco leaves within jackfruit leaf. Banana plant leaves that have been dried occasionally are used. Women smoke dhumti in the opposite direction from men, keeping the flaming end inside the mouth. Men smoke dhumti the traditional way.

Smoking dhumti is very common in the Goa region of western India^[12]. The bulk of India's 60% tobacco users only use smokeless tobacco, according to the Global Adult Tobacco Survey (GATS) 2010 study^[13]. We could easily appreciate in this survey that gutkha is also used at less than equal rate as compared to biddis^[14]. Together with the tobacco business, the areca nut industries created a dry preparation in 1975 utilising traditional Indian techniques^[15]. The most evident cause of oral cancer, which accounts for 30 to 40% of cancer cases reported in India, is the heavy use of tobacco products, whether through smoking or smokeless chewing^[16]. As a substitute for smoking, Gutkha has gained traction in traditional society and among those with lower socioeconomic level^[17]. The aggressive advertising and easy packaged sachets, which are sold under a variety of brand names in practically all stores at a reasonable price, are to blame for the rise in gutkha consumption^[18]. Due to its flavoured sweet taste, ease of availability, cost effectiveness, and immediate stimulant, gutkha use can start as early as childhood. The move from paan or smoking to gutkha may be encouraged by its simplicity of purchase and storage as well as by its absence of social stigma^[19]. To get the euphoric effects of nicotine, many people utilise gutkha. increase feelings of wellness, decrease appetite and anxiety (in cab drivers), induce arousal or relaxation, release tension, When we discussed this with our participants, they gave similar justifications for smoking, and we were able to connect that these products are used by taxi drivers mostly for relaxation and focus. Gutkha has had about 4200 chemical components identified^[20]. Participants were willing to discontinue their tobacco use when we requested them to do so since they were aware of the negative impacts that these tobacco products have. In order to assist them minimise or totally stop their habit, we advised them to contact government-sponsored cessation clinics.

At the national and international levels, a number of tobacco control policy initiatives are being carried out to tackle the tobacco epidemic. The existing tobacco user, however, may not directly benefit from these initiatives because nicotine in tobacco is very addictive, making quitting challenging. By 2050, it is predicted that there would be 160 million more smoking deaths worldwide as a result of a shortage of cessation assistance. Nearly 70% of smokers say they want to stop using tobacco, but only 3-5% of them really succeed in doing so. Tobacco cessation centres (TCCs) were established by the WHO in 2002 in partnership with the MHFW, GOI in 13 different locations around India, including cancer treatment facilities, mental facilities, medical institutions, and NGOs^[21]. After questioning

participants if they were aware of these policies, we realised they knew nothing about these cessation clinics. However, we learned that even after being put into place, these policies were not socially promoted. The Ministry of Health and Family Welfare, Government of India, launched the National Tobacco Control Programme (NTCP) in 2008, covering 42 districts of 21 states and union territories of India. The NTCP included the following activities: training and capacity building; information, education and communication (IEC) activities; tobacco control laws; reporting survey and surveillance. Schoolchildren now receive more comprehensive tobacco-related education^[22]. When it comes to using taxes to reduce tobacco usage, India is likewise a soft pedal. The light-touch approach to oral tobacco has extended to bidis, which are essentially more harmful than any other tobacco products. A significant tax must be imposed on the tobacco market. While differential treatment will only lead to product or brand switching, a sharp increase in tobacco product prices will cause usage to plummet. The recent ban on "gutkha," a popular smokeless tobacco product in the nation, has also drawn criticism. It is a crucial tactic to stop this threat. This habit, the main cause of oral cancer, is particularly harmful to children and women. However, both this prohibition and the one against smoking in public spaces need to be more strictly enforced. The graphic health warnings on tobacco product packaging required by Section 7 of the COTPA must also be more forceful and aggressive^[23]. The fact that even a small number of these cab drivers' relatives used tobacco in some way could encourage similar dangerous behaviours in the next generations. In this piece, we could see that even after using tobacco products, the cab drivers were ready to give up their bad habits. However, they were unable to approach the path of quitting since they were unaware of the policies for quitting cigarettes. We got to the conclusion that despite the government's many cessation policies, social publicity and awareness were not up to par. This article will assist many tobacco users as well as the government in understanding the present state of tobacco control regulations. It will also assist the Indian government in addressing some policy shortcomings and launching an awareness campaign for those who are eager to quit smoking.

CONCLUSION :

This study examines the tobacco use habits of Mumbai's cab drivers. This poll is unique in that it focuses on the effectiveness of tobacco cessation programmes in Mumbai and cab drivers' attitudes

about tobacco use patterns. These are critical factors for nations like India, where non-smoking tobacco usage is the norm. This study comes to the conclusion that, despite the government providing cessation policies for tobacco users, awareness of these programmes is still lacking. The results of the survey show that more than 60% of cab drivers smoke. Only 40% of persons are aware of the policies regarding cessation. 99% of tobacco users are willing to stop using it. In Mumbai, 60% of taxi drivers were aware of the negative consequences that taxi drivers have on the city. Taxi drivers in Mumbai have high tobacco usage rates but little knowledge of tobacco policy, which suggests that tobacco awareness and cessation programmes need to be integrated into the taxi drivers' culture.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Research Article

Effect of Open & Closed Kinetic Chain exercises vs Closed Kinetic Chain exercises with hip strengthening exercises in Patellofemoral pain Syndrome – A Comparative Study

Deeksha Yadav

Department of Physiotherapy, People's College of Paramedical Sciences & Research Centre, People's University, Bhopal, India.

ABSTRACT:

Background- Patellofemoral pain syndrome is one of the most common musculoskeletal overuse injuries of limb. The syndrome can affect 25% of population. Women are affected twice more often than men. Biomechanical factors include weak medial bend with medial turning of femur, exaggerated Q-angle, pes planus and pes cavus with exaggerated inner arch. Muscle factors include quadriceps weakness, tightness of iliotibial band, hamstrings, adductors, external oblique and calf muscles. Treatment is given in form of open Kinetic chain exercises and closed Kinetic chain exercises versus closed Kinetic chain exercises with hip strengthening. This study was designed to compare the efficacy of these exercises on this syndrome.

Materials & Methods- Total 30 patients suffering from the syndrome aged 35 to 60 years were allocated in two groups A and B using purposive random sampling. Group A received open Kinetic chain exercises and closed Kinetic chain exercises. Group B received closed Kinetic chain exercises with hip strengthening. Both groups participated for 4 weeks. Before and after the period outcome measures were assessed using VAS, NPRS and KUJALA questionnaire respectively. Data was analyzed using paired t-test, unpaired t-test, mean difference and standard deviation.

Results - The study indicated that close Kinetic chain exercises along with hip strengthening exercises (Group B) for 4 weeks brought significant changes in relieving pain along with improving functional activities. Likewise, it was revealed that there was a significant pain relief as well as function improvement in Group A. Comparing two groups illustrated that benefits of closed Kinetic chain with hip strengthening outweighed open Kinetic chain and closed Kinetic chain exercises.

Conclusion- Overall, both treatments were efficient in relieving pain as well as improving function. However close Kinetic chain with hip strengthening exercises were more effective.

KEYWORDS: Patellofemoral pain syndrome, open Kinetic chain, close Kinetic chain, visual analog scale, numeric pain rating scale.

Address for correspondence : Deeksha Yadav, 209, Inside Sainyer Gate, New Kali Badi, Jhansi, India, E-mail: deekshayadav79412@gmail.com

Submitted: 16.08.2023, **Accepted:** 04.11.2023, **Published:** 26.12.2023

INTRODUCTION:

Patellofemoral pain syndrome (PFPS) is one of the most common musculoskeletal overuse injuries of lower limb. Patellofemoral pain syndrome is defined as peri-patellar pain due to physical, bio-mechanical and soft tissue changes in the Patellofemoral joint. In

general, patellofemoral pain can affect 25% of the population. It is more common in adolescents and young adults^[1].

Patients suffer from pain during activities and when climbing stairs and hills. It can also be caused by bending your knees and sitting for long periods of

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doi.org/10.5281/zenodo.10432007

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How to cite this article: Yadav D. Effect of Open & Closed Kinetic Chain exercises vs Closed Kinetic Chain exercises with hip strengthening exercises in Patellofemoral pain Syndrome – A Comparative Study. PJSR.2023;16(2):12-15.

time. One or both knees can be affected. There are various theories about the pathophysiology of PFPS, but the classification of the resulting forces involved in the dynamic and static knee position is the beginning of study of this syndrome. It is known as runners knee. The incidence of anterior knee pain is high and is seen in 22/1000 persons per year. It often affects those who engage in running, basketball and other sports. Women are affected about more than twice as often as men. It is a chronic disease that tends to be exacerbated by activities such as squatting, sitting, stair climbing and running. Historically known as fore-knee pain, this can be misleading because pain is felt on all sides of the knee together with the popliteal fossa.

Bio-mechanical factors weaken medial band with medial turning of femur along with compensatory pes-planus. The exaggerated Q angle is a general bio-mechanical factor that causes ache inside the interior knee.

Muscle factor- quadriceps weakness especially the vastus medialis, tightness of iliotibial band, external oblique, calf muscles, hamstring and adductor muscles are the common factors. The degree of difference in diagnosis of PFPS includes chondromalacia patella and Patellofemoral tendon disease. PFPS typically occurs in physically active people aged 40 years and younger. Prevalence ranges for PFPS are reported to be from 15% to 33% in adults and 21% to 45% in active adolescents. Common symptoms include diffuse peri patella or localized retro patellar pain during activities such as running, moving up or down stairs, squatting and sitting with knees bent for prolonged periods. Etiology of Patellofemoral pain is that patellofemoral mal-alignment and mal-tracking mechanisms are overload and imbalances in muscle strength and contraction^[2]. The study was designed to compare the efficacy of various exercises on the syndrome.

MATERIALS & METHODS:

The study was carried out in People's College of Paramedical Sciences. The Institutional Ethical Clearance was obtained and the patients were informed about the study. The patients were briefed about the various parameters that would be used to know the effectiveness of 2 types of treatment. Only patients willing to participate were included. Exclusion criteria included non co-operative patients, patients with severe disability and patients with multiple other diseases. Total 30 patients suffering from the syndrome aged 35 to 60 years were allocated in two groups A and B using purposive random sampling. Group A received open Kinetic chain exercises and closed Kinetic chain exercises. Group B received closed Kinetic chain

exercises with hip strengthening. Both groups participated for 4 weeks. The following was the protocol for assessing effectiveness of open Kinetic chain exercises, closed Kinetic chain exercises and hip strengthening.

DIAGNOSTIC TESTS:

Clarke's test, patellar grind test, patellar tilt test, squatting test was done. MRI suggested that increased femoral internal rotation resulted in increased lateral patellar displacement and resultant increased stress in patellofemoral joint.

OPEN KINETIC CHAIN EXERCISES:

These exercises are defined as a combination of successively arranged joints in which the terminal segments can move freely. This form of exercise allows you to train different muscles of your body individually.

CLOSED KINETIC CHAIN EXERCISES:

These exercises are defined as, when resistance is placed through the distal aspect of extremity and remains fixed to the extremity, the motion in which the joints of the limbs work with the contribution of all points. Before and after the period outcome measures were assessed using Numeric Pain Rating Scale (NPRS), Visual Analog Scale (VAS) and KUJALA questionnaire respectively.

NUMERIC PAIN RATING SCALE (NPRS):

The NPRS is an 101 point scale for the patient self reporting of pain full stop it is for adults and children 10 years old or older^[3]. The NPRS-101 consists of asking the pain patient to rate his or her perceived level of pain intensity on a numerical scale from 0 to 100, with the 0 representing one extreme (e.g., 'no pain'), and the 100 representing the other extreme (e.g., 'pain as bad as it could be').

VISUAL ANALOG SCALE (VAS):

It is a 10 cm lines marked with numbers from 0 to 10. Where, 0 means no pain and 10 means maximum pain.

KUJALA QUESTIONNAIRE:

The Kujala score is composed of 13 multiple choice questions: the presence of a limp, the need for support, the ability to walk, the ability to climb stairs, the ability to squat, the ability to run, the ability to jump, prolonged the sitting with knees in flexed position, the presence of knee pain, the presence of knee swelling, the presence of abnormal painful patellar movement,

atrophy of thigh muscles, the deficiency of knee flexion. Total scores range from 0 to 100.

Data was analyzed using paired t-test, unpaired t-test, mean difference and standard deviation.

RESULTS:

The mean difference and standard deviation for pain score and functional ability score between pre and post treatment for group A were recorded. Analysis of the data showed that there is significant reduction in pain score (VAS) and improvement in functional ability score (KUJALA QUESTIONNAIRE) pre and post treatment programs.

The mean difference and standard deviation for pain score between pre and post treatment for group B were recorded. Analysis of the data should that there is reduction in pain and improvement in functional ability. The comparison of significance of reduction in pain score and functional ability score between pre and post treatment programs for group A and group B was done with paired 't' test values.

Unpaired t-test for the pain scores and disability between posttest values of group A and group B indicating there is high significance of pain reduction in group A than group B and for the disability scores between post test values of group A and group B indicating that high significance of disability reduction in group A than group B.

DISCUSSION:

The study was done to know the effectiveness of open Kinetic chain exercises and closed Kinetic chain exercises in comparison to closed kinetic chain exercises with hip strengthening on PFPS. In PFPS limitation of movement is due to tenderness and strength guarding rather than stiffness, once the pain is relieved the patient will be capable to execute normal functional activity.

Tenderness was initiated to decrease effectively in group A as compared to group B. Treatment given in group A reduced pain effectively than treatment given in group B. Our results were similar to other studies^[3,4,5].

The functional improvement of knee was also found to increase effectively in group A while comparing to group B^[6,7,8]. Hence, we can reject the null hypothesis and accept the alternate hypothesis.

For Group A, open Kinetic chain exercises and closed Kinetic chain exercises was used as treatment protocol while for Group B, closed Kinetic chain exercises with hip strengthening was used.

Some studies compared the effect of open Kinetic chain exercises and closed Kinetic chain exercises in management of this syndrome.

Herrington and Al Shashi (2007) and Witrouw et al (2000, 2004) concluded that both open Kinetic chain exercises and closed Kinetic chain exercises were equally effective in management of this syndrome and suggested to use both exercises jointly in treatment of PFPS^[5].

In 2004, E.Witrouw said that open Kinetic chain exercises and closed Kinetic chain exercises lead to an equal long term good functional outcome^[5].

Previously studies have been conducted to evaluate effect of CKC with or without hip strengthening in management of this syndrome. Karime AHassan^[2].

There were significant improvements in pain function and hip muscles peak torque in both groups. However, there was statistically significant difference between groups in hip muscles torque ($p < 0.05$) but pain and function improvements were significantly greater in group B. Similar results were observed in other studies^[9,10,11,12].

CONCLUSION:

There is statistically significant reduction in pain and improvement in functional ability between pre and post treatment programs in open kinetic chain exercises and closed kinetic chain exercises. Moreover, closed kinetic exercises with hip strengthening showed better results.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Research Article

Effect of Medial Shift Taping of Patella with Strengthening Exercises and Ultrasound vs Strengthening Exercises with Ultrasound in Osteoarthritis of Knee

Sonam Narware

Department of Physiotherapy, People's College of Paramedical Sciences & Research Centre, Bhopal, India.

ABSTRACT:

Background- Osteoarthritis is a chronic progressive, degenerative disorder characterized by cartilage loss. It affects almost 70-80% of population causing pain, physical disability and decreased quality of life. Medial shift taping of patella is an efficacious treatment of knee osteoarthritis and is significantly better than neutral and lateral taping. Therapeutic ultrasound to increase effectiveness of strengthening exercises for knee osteoarthritis significantly lessens joint swelling, increasing joint mobility and reducing inflammation in Osteoarthritis knee patients.

Materials & Methods- Total 60 patients suffering from the Osteoarthritis knee were included and randomly grouped. First group received medial shift taping of patella with strengthening exercise and ultrasound while the other group received strengthening exercise with ultrasound alone. Both groups participated for 3 weeks. Pre & Post treatment outcome measures were analyzed using Mann Whitney U test, Lequesne Knee Scores, Wilcoxon Matched Paired Test, mean and standard deviation.

Results- The study indicated that medial shift taping of patella with strengthening exercise and ultrasound for 3 weeks brought significant changes in relieving pain along with improving functional activities.

Conclusions- Both treatments were efficient in relieving pain as well as improving function. However medial shift taping of patella with strengthening exercise and ultrasound was found to be more contributory.

KEYWORDS: Osteoarthritis, visual analog scale, numeric pain rating scale, Western Ontario and McMaster Universities Arthritis Index.

Address for correspondence : Sonam Narware, S1A, Block Nikhil Homes 7 & 8 Kunjan Nager Phase 2, Baghmugaliya, Bhopal, India, E-mail: sonamnwarware9@gmail.com

Submitted: 17.09.2023, **Accepted:** 30.11.2023, **Published:** 26.12.2023

INTRODUCTION:

Osteoarthritis (OA) is a chronic progressive, degenerative disorder characterized by cartilage loss. It is more prevalent disease in our society. It results in cystic degeneration of bone surrounding and narrowing of joint space^[1].

Worldwide OA is estimated to be the fourth leading cause of disability in which 10% are males

and 13% are females. In Asia, prevalence rates of OA knee were found to be high in elderly people, especially women^[1].

OA is a common problem for many people after middle age and is sometimes referred to as degenerative or wears and tears arthritis. OA may result from an injury to the knee earlier in life.

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Quick Response Code:



Website:

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DOI:

doi.org/10.5281/zenodo.10432018

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How to cite this article: Narware S. Effect of Medial Shift Taping of Patella with Strengthening Exercises and Ultrasound vs Strengthening Exercises with Ultrasound in Osteoarthritis of Knee. PJSR. 2023; 16(2):16-21.

Fractures involving the joints surface, instability from ligament tears, and meniscal injuries can all cause abnormal wear and tear of the knee joint. Not all cases of OA are related to prior injury, however research has shown that some people are prone to develop OA and this tendency may be genetic^[1].

In India, the prevalence of OA ranges from 22% -39%. Knee OA has a high prevalence rate compared with other types of OA and its presentation starts at an earlier age group, particularly in younger age groups of obese women. About 13% of women and 10% of men aged 50 years and older have symptomatic knee OA.

The ARA (American Rheumatism Association) has classified OA as primary and secondary. Primary knee OA is the one which develops without a known cause and is further classified into: medial, lateral and patellofemoral compartment. Secondary knee OA can be due to trauma, congenital disorders, developmental disorders, calcium deposition disease and other bone and joint disease. two types: primary and secondary^[2].

MEDIAL SHIFT PATELLA TAPING:

Patella taping (**Alonazi Asma et. al., 2021**) was initially developed to create a mechanical medial shift to the patella, thereby centralizing it and improving patellar tracking. In the appropriate hands and with the right technique, patellar taping is successful, and it is very effective in reducing the level of pain during activities that create large knee joint reaction forces. Taping can also help reduce short-term pain with activity^[3].

STRENGTHENING EXERCISE:

Strengthening exercises are designed to increase the strength of specific group of muscles. Strengthening exercises overload the muscle until the point of muscle fatigue. This force and overload of a muscle encourage the growth, increasing the strength. Muscle strengthening and aerobic exercise are effective in reducing pain and improving physical function in patients with mild to moderate OA of the knee^[4].

ULTRASOUND THERAPY:

Ultrasound therapy is a form of mechanical energy that uses mechanical vibrations beyond the normal human sound range that is from 16 Hz to 20000Hz. Frequency routinely used in therapy are typically 1.0 and 3.0 Hz. Long-duration, low-intensity ultrasound significantly reduced pain and improved joint function in patients with moderate to severe osteoarthritis knee pain^[5].

VISUAL ANALOGUE SCALE:

The intensity of pain can be measured by VAS. You can use 10 cm lines marked with numbers from 0 to 10. Where, 0 means no pain and 10 means maximum pain^[6].

NUMERIC PAIN RATING SCALE (NPRS):

The Numeric Pain Rating Scale (NPRS) is a segmented numeric version of the visual analog scale (VAS) in which a respondent selects a whole number (0–10 integers) that best reflects the intensity of the individual's pain^[6].

WOMAC:

The WOMAC index is most common used tool, introduced in 1988, for evaluating the health status of knee OA patients. It includes 33 items-clinical symptoms (5 questions), severity of joint stiffness (2 questions), degree of pain (9 questions) and ADL's (17 questions). Each question has 5 subscales where best situation scores as never or none and the worst one names as extreme or always. Higher score are representatives of better situation and less pain^[7].

The present study was carried out to know about the effectiveness of strengthening exercises with ultrasound in OA of knee with and without medial shift taping of patella.

MATERIALS & METHODS:

APPARATUS AND MATERIALS:

- ❖ Ultrasound instrument with accessories.
- ❖ McConnell tape.
- ❖ Resistance bands.
- ❖ Non elastic white tape, Leucoplast, Micropore,
- ❖ Scissors

METHODS:

The study was carried out in People's College of Paramedical Sciences, Bhopal. Institutional ethical clearance was obtained. The participants were explained about the study and informed consent from each of them was obtained. 60 patients with knee OA were included and randomly assigned 2 groups (Group A & Group B). Group - A received medial shift patella taping with ultrasound and strengthening exercise. Group B received ultrasound and strengthening exercises alone. Medial taping of patella was applied for 4 days with 3 days of rest in between. Strengthening exercises included seated leg presses, leg extensions and leg curls. Exercise was

advised 4 days per week, with 2-3 sets per exercise at 8-15 repetitions per set. Ultrasound treatment of 1 MHz, frequency with application time of 5 minutes on the medial side and 5 minutes on lateral side of knee was prescribed for 4 days in a week.

PROCEDURE:

Participants referred by an orthopedic surgeon were selected and assessed as per the selection criteria. Outcome measures used were NPRS and WOMAC scale. The participants were randomly divided into 2 groups: Group A and Group B.

Group -A received medial shift taping of patella, ultrasound with strengthening exercises.

Group-B received only ultrasound with strengthening exercises.

Outcome measures were assessed at baseline before treatment on day one and at the end of intervention (3rd week).

Ultrasound treatment of 1MHz frequency with application time of 5 minutes on the medial side and 5 minutes on lateral side of knee was given for 4 days in a week.

STRENGTHENING EXERCISE

In supine position, the patient was asked to hold the patella in cephalic position for 10 seconds and then relax. The contraction was carried out for 10 repetitions with rest in between. A total of 50-75 contractions are usually done.

MEDIAL TAPING PROCEDURE:

The patient positioning was relaxed, supported long sitting with the knee aligned in a neutral position. The area of the knee to be taped was shaved and made clean. A 2.5 cm wide and 20 cm long white tape was secured at the lateral border of the patella and pulled medially. Soft tissue was taken up at the medial aspect of the thigh and then the tape was secured along the medial border of femoral condyle. The knee cap was taped for 4 alternate days in a week. There were 2 types of tapes used. The first tape applied was a white protective tape (micropore), which is meant to provide a firm surface for the more adhesive tape (McConnell tape). To assess the effect of taping, a pain provoking activity such as a single or double squat was performed immediately prior to taping and repeated afterwards. If the tape is applied correctly the post taping squat will be painless.

STATISTICAL ANALYSIS:

After completing the data collection the data

was analyzed using NPRS scale and WOMAC scale.

STATISTICAL TOOLS:

In our study statistical method used were mean, Standard Deviation, t-test etc.

Table 1: Distributions of patients by age groups in Group A and Group B.

Age groups	Group A	%	Group B	%	Total	%
50-55yrs	13	23.33	14	36.67	18	30.00
56-60yrs	17	40.00	16	43.33	25	41.67
Total	30	100.00	30	100.00	60	100.00
Mean age	59.00		57.23		58.12	
SD age	4.65		3.87		4.33	

RESULTS:

In this study, 60 patients between the age group of 50-60 years, with a history of arthritis ranging in duration from 6 months to 2 years were taken. The sample consisted of 17 females and 13 males with all subjects having unilateral symptoms. The 60 subjects were divided in to two groups of 30 each and named experimental and control group. Experimental group was given medial taping technique in addition. Duration of the treatment was 4 alternate days in a week for 3 weeks. The outcome measures taken were NPRS and WOMAC scale which were recorded before and after the treatment. The pre-and post-test values were statistically tested using t test for their level of significance. Table 1 depicts the mean age and standard deviation of study subjects. The mean age of subjects in Group A is 59 ± 4.65 while for Group B is 57.23 ± 3.87 . Total mean age and standard deviation for whole study was 58.12 ± 4.33 . The commonly affected age group in this study was 56-60 years. Table 2 represents the distribution of subjects according to the gender. Both the groups had equal number of males and females that is 15 (50%). Table 3 shows the comparison and difference of group A and group B with respect to NPRS and WOMAC scale at 1st day and 3rd week. The baseline scores of NPRS and WOMAC scale on day 1 in both the groups showed no significant difference ($p=0.0001^*$). The mean pain scores at 1st day of group A was 7.07 ± 1.01 and of group B was 7.20 ± 0.89 while at 3rd week for group A was 3.57 ± 1.17 and group B was 5.70 ± 1.15 . Table 4 represents the comparison and difference of group A and group B with respect to

Table 2: Distribution of patients by gender in Group A and Group B.

Gender	Group A	%	Group B	%	Total	%
Male	15	50.00	15	50.00	30	50.00
Female	15	50.00	15	50.00	30	50.00
Total	30	100.00	30	100.00	60	100.00

Table-3: Comparison of Group A and Group B with respect to NPRS and WOMAC scale at 1st day, 3rd week and their differences by Mann Whitney U test.

Variable	Groups	Mean	SD	Sum of ranks	u-value	z-value	p-value
1 st day	Group A	7.07	1.01	883.00	418.00	-0.4731	0.6361
	Group B	7.20	0.89	947.00			
3 rd week	Group A	3.57	1.17	559.50	94.50	-5.2559	0.0001*
	Group B	5.70	1.15	1270.50			
Difference	Group A	3.50	1.20	1288.50	76.50	-5.5220	0.0001*
	Group B	1.50	1.04	541.50			

* $p < 0.05$.**Table 4: Comparison of group A and group B with respect to Lequesne knee scores at 1st day, 3rd week and their difference by t test.**

Variable	Groups	Mean	SD	t value	p-value
1 st day	Group A	9.65	2.31	0.2271	0.8315
	Group B	9.53	1.61		
3 rd week	Group A	4.48	1.15	-10.6290	0.0018*
	Group B	8.50	1.72		
Difference	Group A	5.17	1.66	12.3070	0.0065*
	Group B	1.03	0.80		

* $p < 0.05$.**Table 5: Comparison of different time points i.e. 1st day and 3rd week with respect to NPRS and WOMAC scale in Group A and Group B by Wilcoxon matched pairs test.**

Groups	Time	Mean	SD	Mean Diff.	SD Diff.	% of change	z-value	p-value
Group A	1 st day	7.07	1.01	3.50	1.20	49.53	4.7616	0.0001*
	3 rd week	3.57	1.17					
Group B	1 st day	7.20	0.89	1.50	1.04	20.83	4.3493	0.0001*
	3 rd week	5.70	1.15					

* $p < 0.05$.

Lequesne knee scores (LKS) at 1st day and 3rd week. Baseline scores at day 1 showed no statistical significant difference between both the groups. The mean value of LKS at 1st day for group A was 9.65 ± 2.31 and for group B was 9.53 ± 1.61 while at the 3rd week was 4.48 ± 1.15 and 8.50 ± 1.72 for group A & group B respectively. Table 5 depicts the comparison

of percentage of changes found in the pain scores in Group A and Group B. Group A showed 49.53% reduction in pain & Group B showed 20.83%. Both the groups showed significant reduction in pain ($p = 0.0001$) but the percentage reduction in pain of Group A was more as compared to Group B. Table 6 depicts the comparison of percentage changes in LKS found in Group A and Group B. Group A showed 53.54% of

Table 6: Comparison of different time points i.e. 1st day and 3rd week with respect to NPRS and WOMAC scales in group A and group B by paired t test

Groups	Time	Mean	Std. Dv.	Mean Diff.	SD Diff.	% of change	Paired t	p-value
Group A	1 st day	9.65	2.31	5.17	1.66	53.54	17.0739	0.0034*
	3rd week	4.48	1.15					
Group B	1 st day	9.53	1.61	1.03	0.80	10.84	7.0926	0.0892*
	3rd week	8.50	1.72					

improvement in LKS as compared to group B which was 10.84%. Both the groups showed significant improvement ($p < 0.0892$) however percentage improvement in Group A was more than in Group B.

The result showed that the experimental group was better than the control group in reduction of pain and gaining improvement in functional ability.

DISCUSSION:

This study was intended to find out whether medial shift taping of patella with strengthening and ultrasound proves beneficial in treatment of osteoarthritis knee in comparison with strengthening and ultrasound alone.

Analysis of the number of individuals in gender and site variations between experimental and control group using Mann Whitney u test revealed that there was no significant difference in terms. Analysis of the mean change in pain at knee had revealed a statistically significant difference at 5% level of significance in experimental group who received medial shift taping along with ultrasound and quadriceps strengthening exercises and home exercises than the control group who received ultrasound and strengthening exercises. Similar results were seen in other studies^[8,9,10].

Analysis of the mean change in function at knee using Knee Joint Evaluation Scale revealed a statistically significant difference at 5% level of significance in experimental group who received medial shift taping along with ultrasound, isometric strengthening exercises than control group who received ultrasound, strengthening exercises along with home exercise. Similar results were seen in other studies^[8,9,10].

Results obtained after analysis of pain in experimental group showed that there is 15.4% reduction in pain which was statistically significant in those patients who received taping technique when compared with control group at the end of day 7. Analysis of results regarding knee Joint Evaluation Scale in experimental group showed a significant improvement of 20.4% at the end of day 7.

Results obtained after analysis of pain in control group showed 4.6% improvement at the end of day 7 using ultrasound and strengthening exercise alone.

Analysis of results between pretest and posttest values of control group regarding Lequesne knee scores showed that there was improvement of function of 10.6% at knee following ultrasound and strengthening exercise on day 7. Similar results were seen in other studies^[8,9,10].

CONCLUSION:

Medial shift taping in addition to ultrasound and knee exercises is better than alone ultrasound and knee exercises.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Case Report

Pleomorphic Adenoma mimicking Schwannoma-Like phenotype: A Case Report

Sajda Khan Gajdhar¹, Shaiq Gajdhar², Syed Mukith¹, Sabiha Mokashi Khan³

¹Department of Oral and Maxillofacial Pathology, Ibn Sina National College for Medical College for Medical Studies, Jeddah, Kingdom of Saudi Arabia (KSA), ²Department of Oral and Maxillofacial Rehabilitation, Ibn Sina National College for Medical College for Medical Studies, Jeddah, Kingdom of Saudi Arabia (KSA), ³Medical Officer-Indian Cancer Society, Parel, Mumbai, India

ABSTRACT:

The schwannoma-like pleomorphic adenoma is a rare histopathological variant of the pleomorphic adenoma. It can occur in any salivary gland; however it is most commonly detected in the parotid. Pleomorphic adenomas are well-known for their cytomorphological and architectural variability, which is characterised by the presence of intermixed epithelial and mesenchymal-like components. We present a rare case of parotid gland pleomorphic adenoma with prominent schwannoma-like characteristics that mimicked a benign schwannoma. The tumour had a high prevalence (about 80%) of schwannoma-like regions with a localised (approximately 20%) epithelial component along with tubular organisation. Only 8 cases of schwannoma-like pleomorphic adenoma have been documented in the literature, to the best of our knowledge. The differential diagnosis between this entity and neurogenic and myogenic tumors is discussed.

KEYWORDS: Salivary gland tumor, Schwannoma-like pleomorphic adenoma, Parotid, Pleomorphic adenoma, Mixed tumors

Address for correspondence : Dr Sajda Khan Gajdhar, Lecturer, Department of Maxillofacial Pathology, Ibn Sina National College for Medical College for Medical Studies, Jeddah, Kingdom of Saudi Arabia (KSA), E-mail: drsajdagajdhar@gmail.com

Submitted: 16.09.2023, **Accepted:** 30.11.2023, **Published:** 26.12.2023

INTRODUCTION:

Salivary gland tumors account for about 3% of all head and neck neoplasia. The parotid gland is the main site for these tumors and about 95% of them are of epithelial origin^[1]. Pleomorphic adenoma (PA) is the most common benign salivary gland tumor. The parotid gland is the main site of origin of this lesion, but minor salivary glands can also be affected.^[1] PA represents about 66 % of these benign lesions. Although a large majority (95%) of PAs are benign, a small fraction may show an aggressive behaviour (carcinoma ex pleomorphic adenoma). This may occur after multiple local recurrences and/or radiotherapy^[1-2]. Conventional PAs are characterized by a biphasic appearance, resulting from the intimate admixture of epithelium and

mesenchymal-like components with low mitotic activity, lacking features of cellular atypia and nuclear hyperchromasia. Frequently a matrix rich in glycosaminoglycans is present. The proportion of benign versus malignant tumor varies greatly by site. In the major salivary glands, such as the parotid and the submandibular gland, the majority of the tumors are benign contrary to the minor salivary glands, such as the sublingual and the floor of the mouth, where most of them are malignant^[1-2]. We present a rare case of parotid gland PA with prominent schwannoma-like characteristics.

CASE REPORT:

A 41-year-old woman presented for a

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How to cite this article: Gajdhar SK, Gajdhar S, Mukith S, Khan SM. Pleomorphic Adenoma mimicking Schwannoma-Like phenotype: A Case Report. PJSR. 2023;16(2):22-25.

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DOI:

doi.org/10.5281/zenodo.10432040

persistent asymptomatic swelling localized in the right retromandibular area since 8 months. A well-defined tumour measuring 1.8 cm, was found in the deep lobe of the right parotid gland, with parapharyngeal extension, according to a head and neck MRI. The radiologic findings pointed to the diagnosis of PA. The lesion was surgically removed and histopathology was performed. Macroscopically the tumor appeared as 1.8 cm brownish circumscribed nodule. The lesion was encapsulated and hypercellular under the microscope, and at greater magnification, the tumour showed high aggregates (about 80%) of schwannoma-like regions (Figure 1). The schwannoma-like areas showed tumor cells with spindle type morphology, small elongated and hyperchromatic nuclei arranged in palisades, with broad areas of Antoni A type (Figure 2). The sparse epithelial area was organised in short tubular structures and contained a few duct-like areas, sheets, and cords of tumour cells. There were also eosinophilic, acellular, hyalinized regions surrounded by cords or sheets of tumour cells (Figure 3). The overall features were suggestive of schwannoma-like pleomorphic adenoma. A regular follow-up showed no recurrence.

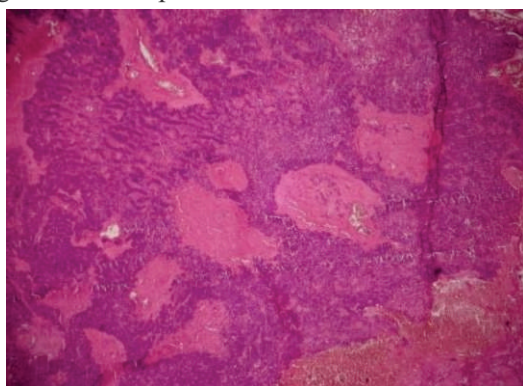


Figure 1: Low magnification of schwannoma-like pleomorphic adenoma with both components (hematoxylin-eosin, magnification 4X).

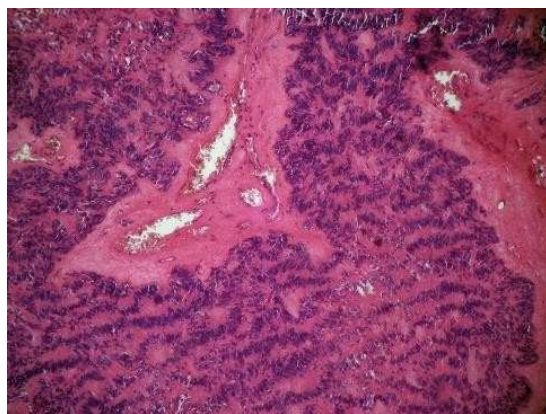


Figure 2: The tumor is composed by spindle-shaped cells with elongated nuclei and ill-defined cell contours, with nuclear palisading resembling Antoni-A areas of schwannoma (hematoxylin and eosin, 10X magnification).

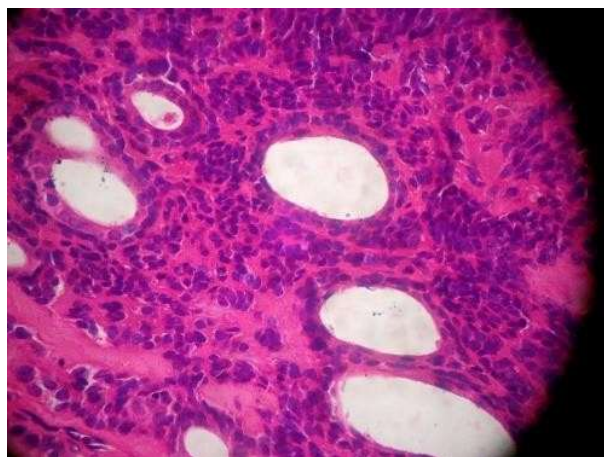


Figure 3: Under high power view the duct like areas are surrounded by double row of cells and hyaline-like collagen (hematoxylin and eosin, 40X magnification).

DISCUSSION:

PAs are well-known for their cytomorphological and architectural diversity. These tumours are made up of both epithelial and stromal components. Although PAs are usually neatly contained, tiny expansions protrude into the adjacent normal tissue in a pseudo-infiltrative pattern. The epithelial cells are derived from ductal epithelial and myoepithelial cells^[1-3]. Tumour cells in the epithelial layer are cuboidal in shape and line duct-like structures that vary in size and shape. Tumour cells of myoepithelial origin (MMCs) contain polygonal, spindle, or plasma cell-like shapes, form sheet, clump, or strand-like structures, and are admixed with a myxoid or myxo-chondroid component^[1-3]. MMCs in PA occasionally form interlacing fascicles, which are usually composed of spindle-shaped cells reflecting neurogenic or myogenic differentiation^[1]. Rarely, small areas of MMCs may exhibit schwannoma-like palisading of nuclei, however this is usually only a localised aspect of the overall tumour mass^[3]. Our case showed features of PA with widespread schwannoma-like characteristics extending in almost the whole lesion. Schwannoma-like PAs are composed of modified myoepithelial cells^[4-5]. PA resembling schwannoma is an extremely unusual lesion; only 8 occurrences of this nosological entity have been documented in the literature (Table 1)^[3-11]. There is a strong predilection for females. 6 of the cases included females and 2 involved males, with ages ranging from 39 to 90 years (mean age 64.5). Our case was seen in female. The lesions were primarily found in the parotid gland (n=6), with the exception of 1 unusual case found in the hard palate and 1 case in submandibular gland. Our case also involved parotid gland. The lesions ranged in size from 1.5 to 3.5 cm

Table: 1 Previously reported case of schwannoma-like pleomorphic adenoma.

S.No.	Authors	Age	Gender	Site	Duration	Size(cm)	Symptoms
1	Merino and Livolsi	74	F	Parotid gland	5 years	2X3	Asymptomatic
2	Takeda and Shimono	62	M	Hard palate	10 months	NA	Asymptomatic
3	Kajor et al.	75	F	Parotid gland	NA	3	Asymptomatic
4	Tille et al.	47	F	Parotid gland	2months	3.2	Pain
5	Lombardi et al.	44	F	Parotid gland	3 months	1.5	NA
6	Chandra et al.	60	M	Parotid gland	12 years	3.5	Asymptomatic
7	Roth SH et al.	90	F	Submandibular gland	NA	3.22	Asymptomatic
8	Roth SH et al.	40	F	Parotid gland	1.5 years	2	Asymptomatic
9	Case	41	F	Parotid gland	8 months	1.8	Asymptomatic

(mean value 2.6 cm)^[3-11]. Areas of spindle cells grouped in palisades resembling a benign schwannoma were noted in all of the reported cases. Fine-needle aspiration biopsy (FNAB) is a widely used diagnostic technique. However, in the presence of lesions with prevalent schwannoma-like architecture this method may be inadequate to distinguish among PA and neurogenic or myogenic tumors^[4-7]. Schwannomas associated with cranial and peripheral nerves have been reported within salivary glands and there are published cases that have been initially misdiagnosed as schwannoma-like pleomorphic adenoma^[7]. In addition, a glandular variant of schwannoma has been also reported in the literature^[8]. This lesion was characterized by entrapped or metaplastic glands in an otherwise pure schwannoma. This extremely rare schwannoma type can add to the uncertainty in the differential diagnosis of schwannoma-like pleomorphic adenoma. An additional technique, such as immunohistochemistry, can be used to alleviate this diagnostic problem: a positive staining for cytokeratin in both the mesenchymal-like and epithelial portions allows the diagnosis of schwannoma-like pleomorphic adenoma^[1].

In conclusion schwannoma-like pleomorphic adenoma is a rare variant of PA that, although biologically benign, deserves to be considered in the differential diagnosis with neurogenic and myogenic tumors of the parotid gland.

CONCLUSION:

Schwannoma-like pleomorphic adenoma is a rare entity that is mostly seen in females and affects parotid gland. This entity should be distinguished from

the other neurogenic and myogenic tumors. Prognosis of this lesion is good.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Case Reports

Radicular Cyst associated with maxillary molar and sinus – A case report with mini review of literature

Sahana A¹, Ashok KP²

¹Department of Oral and Maxillofacial Pathology, ²Department of Periodontics and Implantology, GSL Dental College & Hospital, Rajahmundry, Andhra Pradesh, India

ABSTRACT:

Radicular cysts or Root end cyst are known to be the most common odontogenic cyst of the jaws. They comprise about 60% of jaw cysts and 15% of all periapical lesions. Epithelium at the apex of a nonvital tooth, usually the cell rests of Malassez (also could be crevicular epithelium, sinus lining or sinus tract lining) can be stimulated by inflammation to form this true cyst. This report describes a case of a radicular cyst occurring in a 40 years old female involving posterior maxillary region extending to the maxillary sinus area.

KEYWORDS: Nonvital teeth, odontogenic cyst, Periapical cyst, Enucleation

Address for correspondence : Address for correspondence : Dr. Sahana A, Associate Professor, Department of Oral and Maxillofacial Pathology, GSL Dental College & Hospital, Rajahmundry, Andhra Pradesh, India, E-mail: sahanarrr@yahoo.com
Submitted: 26.08.2023, Accepted: 04.12.2023, Published: 26.12.2023

INTRODUCTION:

Cyst is a common pathological lesion and can occur anywhere in the body. Cysts of oral and paraoral region are usually derived from odontogenic apparatus, their remnants or epithelium entrapped in the line of fusion during development of various facial processes. Cysts of orofacial region are broadly classified under the following categories - Odontogenic, Non-odontogenic and Miscellaneous. The radicular cyst is an example of inflammatory odontogenic cyst^[1]

Radicular cyst (RC) is the most common inflammatory cyst seen at the apices of a grossly decayed or a non-vital tooth. This arises from the epithelial residues (cell rests of Malassez) in the periodontal ligament space². Simon in 1980 showed that RC is of two types – true RC which contains a closed cavity entirely lined by epithelium and periapical pocket cyst or bay cyst which has epithelial lining attached to the margins of the apical foramen in such a way that decayed tooth root canal is open to cystic lumen. As the true RC is completely enclosed it is “self-sustaining” and is more likely to remain behind in

the jaw after the removal of offending tooth, which is referred to as residual cyst. Other similar lesions are inflammatory collateral cyst or periodontal cyst (seen at cervical margin of the lateral aspect of a root), [Figure 1] paradental cyst (lateral aspect of partially erupted mandibular third molar root) and mandibular infected buccal cyst (buccal surfaces of mandibular molars)^[2].

PATHOGENESIS :

Inflammatory cysts of jaws arise as a result of epithelial proliferation within an inflamed tissue which could be due to a physical, chemical or bacterial injury.³ Generally, pulp inflammation is a sequel of dental caries. Bacteria from gingival sulci or periodontal pockets^[4] reach the pulp tissue through exposed dentinal tubules or gap cement-enamel junction at the cervical area of a tooth.⁵ Seeding of microbes through blood stream into the necrotic pulp also contributes (anachoresis)^[6]. Polymicrobial community of anaerobic flora flourish in the selective habitat of the

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doi.org/10.5281/zenodo.10432070

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How to cite this article: Sahana A & Ashok KP. Radicular Cyst associated with maxillary molar and sinus – A case report with mini review of literature. PJSR. 2023;16(2):26-30.

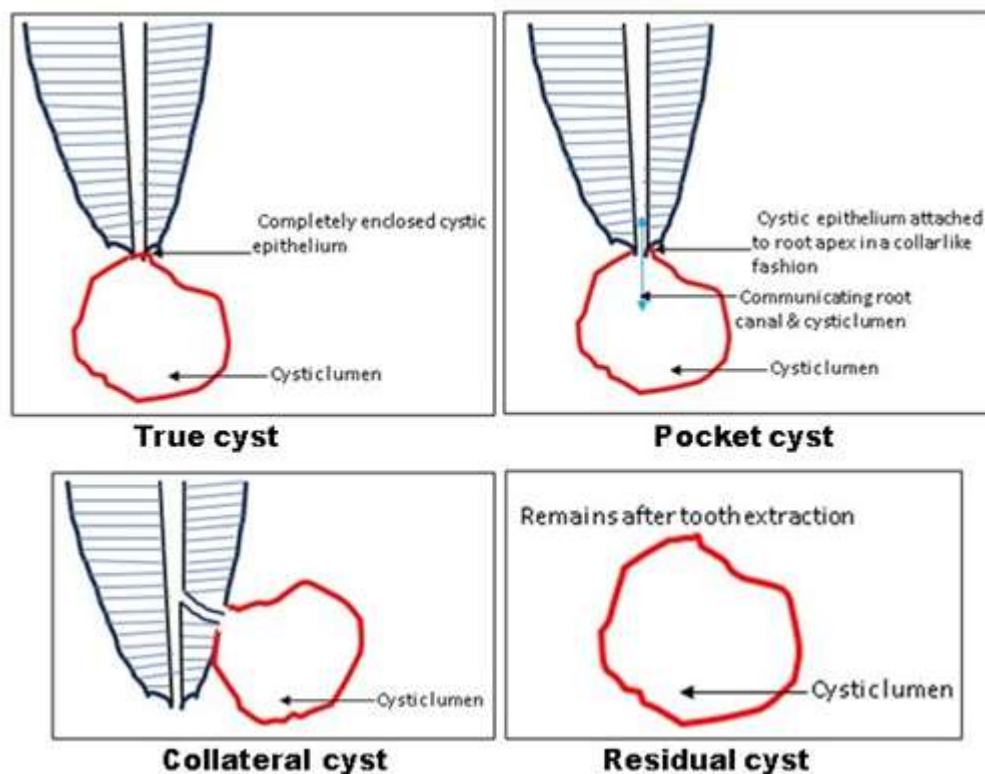


Figure 1: Schematic diagram representing the types of radicular cyst.

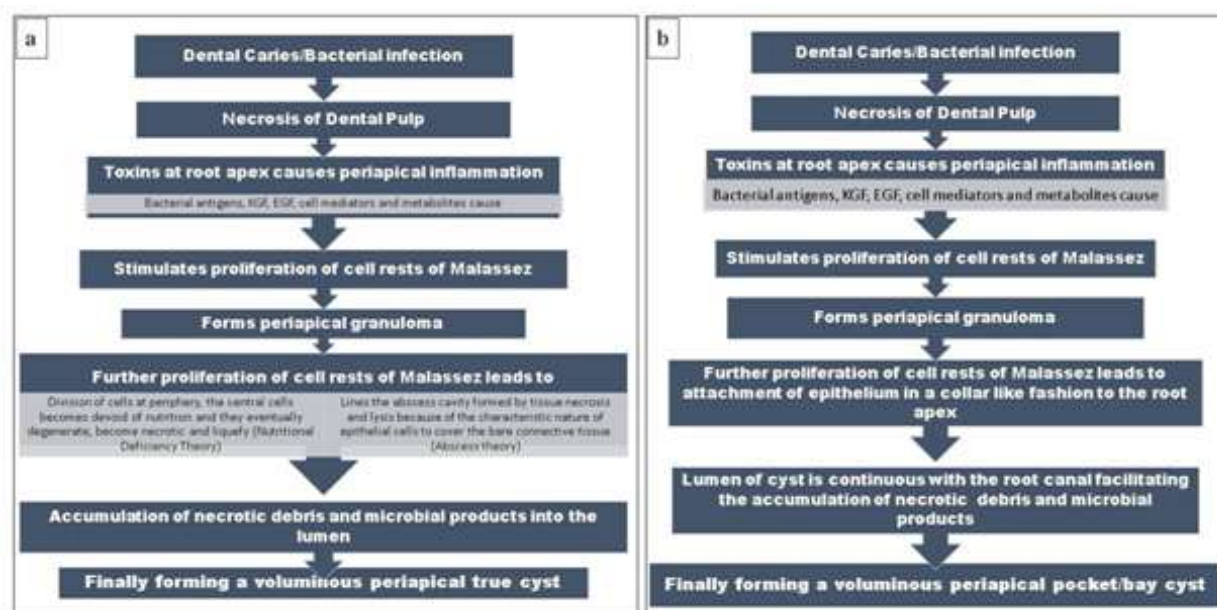


Figure 2a & b: Flowchart representing the pathogenesis of periapical true cyst and bay cyst respectively.

root canal. These microbes exhibit various biological and pathogenic properties like antigenicity, mitogenic activity, enzymatic histolysis, chemotaxis and activation of host cells. As the microbial invaders reach the apex of tooth, they encounter the host defence forces and clash, leading to destruction of periapical tissue.

Further, this continues and can form several categories of periapical lesions. Such chronic lesions can develop a periapical cyst, but not every chronic lesion develops into a cyst.^[5,7] [Figure 2a & b]

Though, RCs are inflammatory odontogenic cysts they are painless and asymptomatic and are often

said to be painless unless infected. Therefore, most of the times the radiographic investigations of nonvital teeth leads to diagnosis of asymptomatic radicular cysts. Initially the swelling is bony hard. In later stages it exhibits 'springiness' or 'egg shell crackling' of the surrounding bone. As the cyst becomes more chronic and increases in size the bone gets completely eroded and swelling becomes fluctuant.^[8]

RC is most commonly seen in males, with a male predilection (M:F 1.6:1) and age range of 30-50 years in the maxillary anterior region⁸. This present case is an unusual presentation of radicular cyst which does not have the above-mentioned common features.

CASE REPORT :

A 40 years old female patient came to our institution with a swelling in the left upper back region of jaw. She gave a history of mild pain in swelling for 2 months which aggravated since 15 days. She took medicines given by local pharmacist which relived the pain for few hours and then continued with same intensity.

Solitary swelling over the left upper third of the face, size approximately 2.5×2.0 cm, oval in shape, extending anteriorly to obliterate the nasolabial fold,

superiorly till the lower border of eye, the borders were ill-defined and the skin over the swelling appear normal. On palpation, all inspectory findings in relation to the site, size, shape, border, skin over the swelling were confirmed with a mild rise in local temperature and soft to bony hard consistency.

Intraorally, the swelling was tender, soft to hard in consistency and drainage of salty fluid at the root stumps of left first maxillary molar. There was no oro-antral communication noted.

Radiographically, orthopantomograph and CBCT of the area showed a unilocular radiolucent lesion associated with root stumps of 26 with ill-defined borders measuring about $1.5 \text{ cm} \times 2 \text{ cm}$ within the jaw. Superiorly, it was extending in to the maxillary sinus. Based on the clinical, radiographic and 3D construction image, provisional diagnosis of radicular cyst was made (Fig 3a, b & c).

FNAC (fine needle aspiration cytology) was done on the day of visit (Fig 4a & b). Extraction of root stumps and cystic enucleation under local anaesthesia was planned. The cystic lining was enucleated and was preserved for histopathology examination. After the bleeding was controlled, the flap was sutured back and primary closure was achieved.

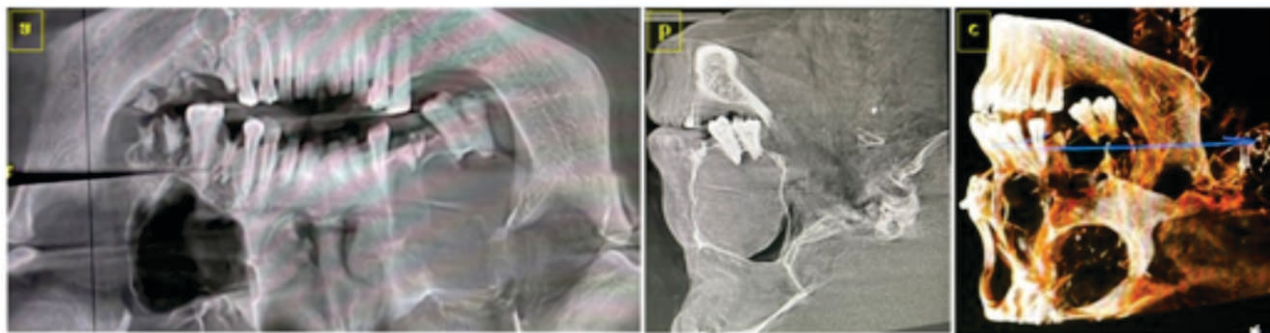


Figure 3a, b & c : OPG, CBCT and 3D construction image showing the involvement of lesion from periapical area to the maxillary sinus.

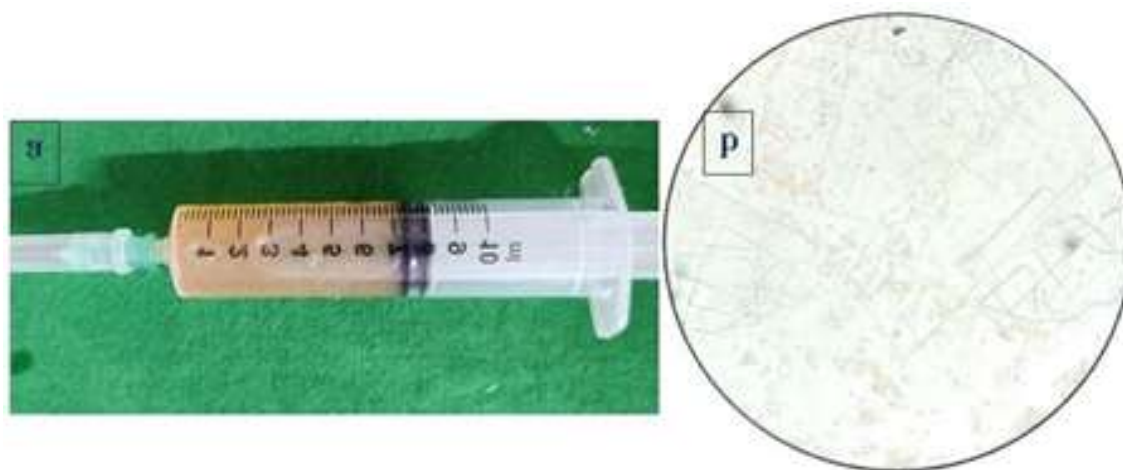


Figure 4a & b : "Shimmering Gold" effect seen in fluid collected from FNAC of lesion and cytology of the same showed cholesterol crystals.

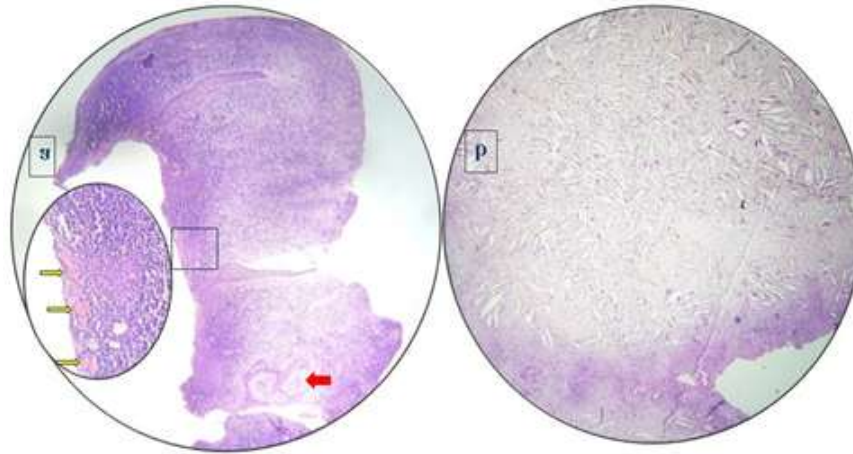


Figure 5a & b: Microscopically arching pattern of epithelium (red arrow), Rushton bodies (yellow arrows) & Cholesterol clefts

Microscopic examination of a haematoxylin & eosin-stained sections revealed a cystic lumen lined by nonkeratinized stratified squamous epithelium in arching pattern. Focal area also showed presence of pseudostratified ciliated columnar epithelium. The underlying fibrous connective tissue showed infiltration of mixed inflammatory cells, cholesterol clefts, haemorrhagic areas, hemosiderin pigments and dilated blood vessels with engorged RBC's (red blood cells) in its lumen (Fig 5a & b). Regular follow-up after every 6 months was done and patient is asymptomatic post treatment.

DISCUSSION:

RCs are amongst the most common cystic lesions of the jaw. They develop as a result of inflammatory processes within the root canal system of a tooth, leading to pulpal necrosis.^[9] Patient often complains of slowly enlarging swellings. A sine qua non for the diagnosis of a RC is the related presence of a tooth with a non-vital pulp.^[10]

According to Mass et al^[5] the prevalence rate of radicular cysts associated with primary molars is probably higher compared permanent molars. It is possible that, unlike cysts of permanent dentition, primary teeth are extracted but not submitted for pathological examination, a fact that may account for the low estimation of the real frequency of cysts associated with primary teeth.^[11]

Radiographically, most RCs appear as round or pear shaped unilocular radiolucent lesions in the periapical region. The cysts may also displace or cause mild root resorption of adjacent teeth. Involvement of maxillary sinus is rare. Our case showed extension of cyst in the sinus cavity. Distinguishing between granuloma and a cyst is impossible, although some say that if the lesion larger than 2 cm is more likely to be a cyst.^[12]

The surgical approach to this cyst is either marsupialization or enucleation. The treatment of choice is dependent on the size and localization of the lesion, the bone integrity of the cystic wall and its proximity to vital structures. In case of RC associated with primary teeth conservative treatment is planned to save the underlying permanent tooth bud and monitoring the eruption of the tooth.⁸ Follow up is highly recommended considering the recurrence rate of the lesion. Through correct treatment, prognosis is usually promising.^[13]

CONCLUSION:

Careful clinical examination combined with thorough imaging modalities to evaluate the general aspects of this lesion is important as, it is asymptomatic in nature and goes undiagnosed most of the times. The complete case details along with histopathological confirmation of the diagnosis will guide for the selection of the best treatment plan. Proper treatment and long-term follow are recommended as occasionally neoplastic transformations of the epithelial lining of RCs are noted.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Case Report

Psammomatoid Ossifying Fibroma- A case report with review of literature highlighting the change in classification

Pratibha Kavle¹, Bhavani Sangala Nagendra¹, Kirti Buva¹, Sneha Masne Deshpande²

¹Department of Oral Pathology and Microbiology, Bharati Vidyapeeth (Deemed to be University) Dental College and Hospital, Navi Mumbai, India, ²Ph.D Research Scholar, Bharati Vidyapeeth (Deemed to be University) Dental College and Hospital, Navi Mumbai, India.

ABSTRACT:

Psammomatoid ossifying fibroma is a rare entity that affects all age groups and is grouped as a variant of ossifying fibroma. PsOF is grouped under benign fibro-osseous lesion as a separate entity. The lesion is seen in all age groups and is not restricted to younger age only. It is highly aggressive and needs to be differentiated from other benign fibro-osseous lesions that are not aggressive. The lesion typically affects paranasal sinuses commonly and shows presence of ossicles known as psammoma bodies. The classification of this lesion has seen a dramatic change over a period of 2 decades. We hereby report a case of Psammomatoid ossifying fibroma of mandible with review of literature.

KEYWORDS: Psammomatoid; ossifying fibroma; psammoma bodies; fibro-osseous lesions

Address for correspondence : Dr Pratibha Kavle, Professor & Head, Department of Oral Pathology and Microbiology, Bharati Vidyapeeth (Deemed to be University) Dental College and Hospital, Navi Mumbai, India, E-mail: pratibhakavle@gmail.com

Submitted: 01.10.2023, **Accepted:** 04.12.2023, **Published:** 26.12.2023

INTRODUCTION:

Psammomatoid ossifying fibroma (PsOF) is a rare entity that affects all age groups and is grouped as a variant of ossifying fibroma (OF). It is seen to affect paranasal sinuses most commonly. This is followed by maxillary and mandibular bone involvement^[1]. OF show 2 variations viz; juvenile trabecular and psammomatoid types. The psammomatoid variant has been reported in various age groups ranging from 3 months to 72 years. PsOF's radiographically depicts ground glass radiopaque appearance of the lesion as an outer thick mantle with central radiolucent area or as a solid radiopacity^[2]. PsOFs are grouped under locally aggressive lesions affecting orofacial regions that histopathologically are characterized by dense cellular fibrous stroma with spheroidal calcifications called

psammoma bodies^[3]. The typical diagnosis of this entity is done by careful clinical features along with radiological and histopathological examination. The commonly advocated treatment is complete surgical excision. We report a case of PsOF in the mandible with review of literature.

CASE REPORT:

A 17-year-old female patient reported to our institute complaining of swelling in lower jaw since 1 year. The swelling was small initially and increased in size over a period of time. The medical & family history were non-contributory. The swelling measured 4 cms X 5 cms and extended from left commissure of the lip to lower border of mandible. No discharge was evident. Radiographic examination revealed well

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doi.org/10.5281/zenodo.10432078

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How to cite this article: Kavle P, Nagendra BS, Buva K, Deshpande SM. Psammomatoid Ossifying Fibroma- A case report with review of literature highlighting the change in classification. PJSR. 2023;16(2):31-33.

defined radiolucency in relation to mandibular incisor extending to mandibular second molar. There were radiopaque masses seen within the radiolucency. Incisional biopsy was carried out. A provisional diagnosis of fibroosseous lesion was made. The patient underwent complete surgical excision and the specimen was submitted for histopathology. The histopathology examination revealed dense cellular proliferation of spindle cells resembling fibroblasts. There were numerous ossicles resembling psammoma bodies. These bodies were acellular showing concentric pattern of lamination and were evenly distributed within the stroma [Figure 1 & Figure 2]. There was no evidence of necrosis and cytological atypia. A final diagnosis of PsOF was made based on the above findings. A regular follow-up for 2 years revealed no recurrence.

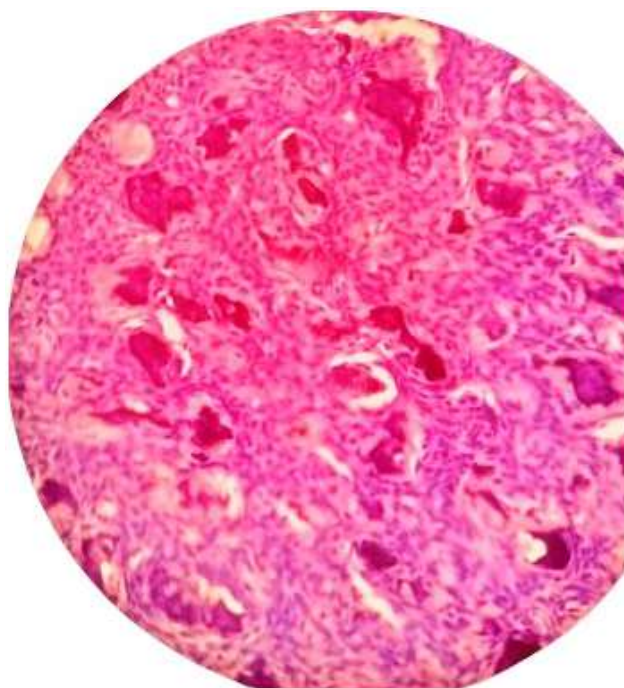


Figure 1: H&E stain shows psammoma bodies in a hypercellular area.

DISCUSSION:

PsOF is a rare aggressive lesion that was first classified as Juvenile form of OF and was known as Juvenile ossifying fibroma in the year 2005 WHO classification. Since earlier reported cases occurred mostly in 1st or 2nd decade of life it was grouped under juvenile variant of OF [4]. The pathogenesis is believed to be associated with *MDM2* and *RASAL1* gene amplifications [5]. The mineralized material consists of spherical or curved ossicles that are acellular or show sparsely distributed cells. These ossicles are characterized by thick irregular collagenous rim and sometimes they are deeply basophilic concentrically

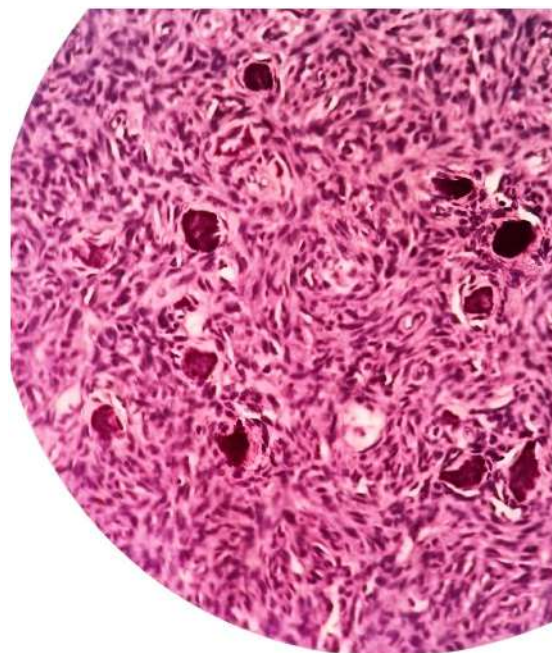


Figure 2: H & E stained section shows plump spindle shaped fibroblasts with psammoma bodies.

lamellated particles^[4]. 2017 WHO classification stated that there are 3 variants of ossifying fibromas: cemento-ossifying fibroma, juvenile trabecular ossifying fibroma, and juvenile psammomatoid ossifying fibroma. PsOF was initially considered as a tumor of odontogenic origin (2005 WHO classification). In 2017 WHO classification, PsOF was considered as a distinctive type of ossifying fibroma, under benign fibro- and chondro-osseous lesions^[6]. The psammoma bodies (ossicles) may fuse to form trabeculae, or may be grouped by fusion of their thick irregular collagenous rim. PsOFs show positivity for vimentin, SMA and CD10^[7]. According to the new classification of WHO 2022, the word “*juvenile*” is removed from the psammomatoid variant and is retained only for the trabecular variant. Moreover, juvenile trabecular ossifying fibroma and PsOF are separated from the odontogenic cemento-ossifying fibroma and are included as separate benign fibro-osseous lesions^[8]. PsOFs share several common features with other fibrous neoplasms. Hence it becomes imperative to rule out other neoplasms as PsOFs are aggressive. The diagnosis is classically based on a triad including clinical symptoms, radiological features and histopathology^[1].

CONCLUSION:

PsOF is an aggressive variant that may mimic other fibro-osseous lesions and demands attention. This lesion is no longer termed as juvenile as was seen in

early classifications. The treatment is essentially complete surgical excision and recurrence is unusual.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Case Report

Pyogenic Granuloma in a Lactating Mother: An Unusual Case Presentation

Vibhuti Shreesh Mhatre¹, Sheetal Choudhari¹

¹Department of Oral Pathology, YMT Dental College & Hospital, Kharghar, Navi Mumbai, India

ABSTRACT:

Pyogenic granuloma is a non-neoplastic soft tissue overgrowth of skin or mucous membrane usually related to inflammatory etiology. It has various etiologic factors; upregulation of female steroid hormones is one of them. Here, we are reporting a case of pyogenic granuloma present on the left lateral border of the tongue in a lactating mother. Unlike the most pregnancy associated pyogenic granulomas, it did not undergo regression post parturition. The possible role of the hormones in the formation of pyogenic granuloma is also discussed here.

KEYWORDS: Pyogenic granuloma, pregnancy tumour, lobulated capillary hemangioma.

Address for correspondence : Dr Vibhuti Shreesh Mhatre, Lecturer, Department of Oral Pathology, YMT Dental College & Hospital, Kharghar, Navi Mumbai, India, E-mail: vibsm.vm@gmail.com

Submitted: 03.10.2023, **Accepted:** 11.12.2023, **Published:** 26.12.2023

INTRODUCTION:

Pyogenic granuloma or pregnancy tumour is a non-neoplastic soft tissue overgrowth of skin or mucous membrane generally arising as a result of inflammatory reaction.^[1,2] Hullihen in 1844 was the first one to describe Pyogenic Granuloma in English literature^[3], but the introduction of the term “pyogenic granuloma” or “granuloma pyogenicum” was given by Hartzell in 1904.^[4] According to many authors, the term 'pyogenic granuloma' is a misnomer, as there is no granulomatous reaction or no pus formation seen.^[5] However, the term is still in use. Pyogenic Granuloma (PG) is usually found on the cutaneous or mucosal surfaces. Among the latter, it most commonly affects the oral cavity,^[6] generally affecting the keratinized tissue.^[7] It is predominantly seen on the gingiva and most often the gingiva of maxillary anterior region is affected.^[8,9] It can affect other oral sites such as lip, tongue, and buccal mucosa. Here, we present a rather unusual case of PG of the tongue in a lactating mother.

CASE REPORT:

A 25-year-old lactating mother to a 14 months old infant was referred to the OPD with a swelling on left lateral border of the tongue. Patient first noticed a small growth on left lateral border of the tongue in the 2nd trimester of her pregnancy about 6 months back, which gradually increased to the present size. No history of associated pain and any other associated symptoms were present, except for a slight discomfort reported by the patient while eating food. Patient did not recollect any history of allergy to any medications. On inspection, a pedunculated growth of quadrangular shape with pinkish white colour and with an approximate size of 3x2x2 cm was present on left lateral border of the tongue extending up to the dorsum of the tongue. The surface of the lesion was rough on palpation and was firm in consistency with irregular borders. The growth was non tender, non-fluctuant and non-compressible. No discharge was present. Temperature over the lesion was normal. The

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How to cite this article: Mhatre VS & Choudhari S. Pyogenic Granuloma in a Lactating Mother: An Unusual Case Presentation. PJSR. 2023;16(2):34-37.

inspectory findings of size and shape were confirmed with palpation and a provisional diagnosis of pyogenic granuloma was given (Figure 1).



Figure 1: Pinkish white pedunculated growth measuring 3x2x2 cm present on left lateral border of tongue.

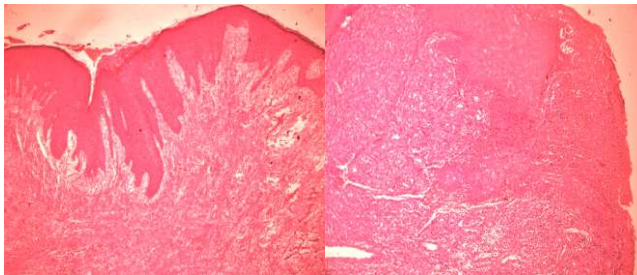


Figure 2: H & E stained section showing proliferated parakeratinized stratified squamous epithelium with underlying vascular connective tissue composed of inflammatory cell infiltrate.

Patient was advised to undergo excision of the lesion and was referred to the department of Oral Surgery for further treatment. After routine blood investigations in the department of Oral Pathology, an excisional biopsy of the lesion was performed under local anesthesia with due consent of the patient in the department of Oral Surgery. The tissue was sent for histopathological examination in the department of Oral Pathology.

A single bit of soft tissue specimen quadrangular in shape measuring 3x2x2 cm in size having irregular surface and firm consistency with reddish brown colour was received. Microscopic examination showed proliferated parakeratinized stratified squamous epithelium of varying thickness with an area of surface ulceration. Underlying connective tissue was composed of moderate chronic inflammatory cell infiltration and rich vascularity with endothelial cell proliferation confirming the diagnosis of pyogenic granuloma (Figure 2).

Excisional biopsy of the lesion was carried out and oral prophylaxis was done. Patient has not reported any recurrence for last six months after excision.

DISCUSSION:

PG is a tumour-like lesion, the pathogenesis of which is still unclear. It was initially considered to be a botryomycosis infection. Hence, the term 'pyogenic' was used. However, many authors believe that the etiology of PG is inflammatory in origin. Hence, PG is considered to be a kind of inflammatory hyperplasia. It is thought to arise as the reaction of tissues to minor injury or chronic irritation^[10]. These may include chronic irritation from dental calculus or retained teeth roots and trauma^[12]. About one-third cases are associated with a history of traumatic injury, especially the extralingival PG^[11,15]. Poor oral hygiene is a precipitating factor in many of the patients^[11,15]. Certain drugs like cyclosporin have also been associated with the formation of PG^[10]. The lesion in the present case started in the second trimester of pregnancy and continued to increase in size. An increased incidence of PG in pregnant women suggests a role of hormonal factors in the etiopathogenesis of this lesion. Hence, terms "pregnancy tumor," "pregnancy epulis" and "granuloma gravidarum" are often used^[7]. There is a striking predilection for gingiva in majority of pregnancy induced pyogenic granulomas (about 75% cases)^[11,16]. The occurrence of the present case on the left lateral border of the tongue in a pregnant woman creates a rather unusual clinical presentation.

The lesion grossly appears as a solitary, red, pedunculated papule that is very friable. Less commonly, it may be a sessile plaque like lesion. It generally shows a rapid exophytic growth, with an ulcerated surface. Sometimes, it shows a slow growth and takes weeks to months to reach optimal size^[12]. It can occur in any age group; however, incidence is more common in females in second decade of life. Male-to-female ratio is 1:1.5^[17]. The colour of the lesion ranges from pink to red to purple depending upon the age of the lesion. Young PGs are red due to rich vascularity with prominent capillaries. As the lesion becomes old, it develops pink colour due to collagenization^[11]. Present case showed a slower growth rate and a pinkish white colour rather than usual reddish pink colour, which suggests an old lesion.

In pregnancy, female steroid hormones may have a dual role on the pathogenesis of pyogenic granuloma. Due to the effect of the female steroid hormones- Estrogen and Progesterone, the concentration of angiogenic factors is increased and apoptosis of granuloma cells is reduced resulting in an enhanced angiogenic effect^[18]. Increased levels of Estrogen hormone in pregnancy are responsible for increased production of vascular endothelial growth factor (VEGF) in the macrophages, an effect that is

antagonized by androgens may be related to the development of pregnancy tumour^[19]. Progesterone functions as an immunosuppressant. It prevents an acute inflammatory reaction, but results in increased chronic tissue reaction, resulting clinically in an exaggerated appearance of inflammation. Usually, there is a regression of pregnancy tumour after parturition. The levels of VEGF are high in the granulomas in pregnancy and almost undetectable after parturition. This may be due to Angiopoietin-2 (Ang-2) causing blood vessels to regress in the absence of VEGF^[7]. However, in this case, lesion continued to grow even after patient's delivery. It can be due to increased levels of hormone Prolactin which is responsible for persistent inflammation and is proangiogenic via the release of pro-angiogenic factors by leukocytes and epithelial cells^[21]. This along with the irritation from the adjacent teeth could be the reason of non-regression and continued expansion of the lesion.

Histologically, two different types of pyogenic granulomas are found. One type shows presence of proliferating capillaries in a lobular arrangement. These lobules are surrounded by collagen fibres. This type is called as lobular capillary hemangioma (LCH) type PG^[2]. The second type consists of highly vascular proliferation resembling a granulation tissue. This is called as non-LCH type of PG. The histopathologic examination in the present case was suggestive of non-LCH type of PG.

Excisional biopsy along with the removal of the irritant should be carried out to treat pyogenic granuloma. Recently, use of Nd:Y lasers has been proposed.

CONCLUSION:

Various etiologic factors such as trauma, chronic irritation, drugs, hormones etc have been implicated in the pathogenesis of PG. The female steroid hormones- Estrogen and Progesterone have a possible role in the formation of pyogenic granuloma and hormone Prolactin may be associated with continued expansion of the lesion post parturition in the present case. Hence, though PG is a non-neoplastic lesion, proper diagnosis, prevention and treatment should be instituted. Regular follow-ups should be carried out periodically to rule out recurrences and possible etiologies.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Research Article

Effectiveness of Daily vs Weekly Iron Folic Acid Tablet Supplements Among Adolescent Girls: A Meta-Analysis

Raksha Narwariya¹, Sunita Choubey²

¹Department of Obstetrics and Gynecology, Career College of Nursing, Bhopal, India, ²Department of Obstetrics and Gynecology, Hamidia Hospital, Gandhi Medical College, Bhopal, India

ABSTRACT:

Background-Anemia is a condition where there is reduction of red platelets (RBCs) or hemoglobin in the blood. This leads to a down regulation of oxygen carrying capacity of blood. On gradual progression of the disease, the manifestations are regularly obscure and may incorporate feeling tired, shortness of breath or a poor capacity to exercise. We carried out a meta-analysis. The aim of the present study was to assess the effectiveness of daily versus weekly iron folic acid tablet supplements among adolescent girls.

Materials & Methods-We searched articles/ studies in online search engines such as Pubmed, Medline, Embase, DELNET, CINAHL, Citation Index, Cohort Library, Cochrane Central, Gray literature. We used keywords such as anemia, iron deficiency anemia, folic acid. The search yielded 69 articles. Seven randomized control studies were included for the meta-analysis according to the inclusion criteria.

Results-Fixed effect model was used to analyze the effectiveness of daily versus weekly iron folic acid tablet supplementation. The present analysis showed an I^2 value of 99.838 signifying varied heterogeneity among the studies. The model showed significant important ($p < 0.0001$) in hemoglobin level after daily iron folic acid tablet supplementation. The findings of the analysis revealed that out of seven studies, five studies favored daily iron folic acid tablet supplementation whereas only two studies were in favor of weekly iron folic acid tablet supplementation.

Conclusion: The present meta-analysis supports daily iron folic acid tablet supplementation as compared to weekly iron folic acid tablet supplement among adolescent girls.

KEYWORDS: anemia, iron deficiency anemia, folic acid

Address for correspondence : Ms Raksha Narwariya, Assistant Professor, Department of Obstetrics and Gynecology, Career College of Nursing Bhopal, India, E-mail: rashinarwariya88@gmail.com

Submitted: 01.09.2023, **Accepted:** 30.11.2023, **Published:** 26.12.2023

INTRODUCTION:

Anemia is a condition where there is reduction of red platelets (RBCs) or hemoglobin in the blood. This leads to a down regulation of oxygen carrying capacity of blood. On gradual progression of the disease, the manifestations are regularly obscure and may incorporate feeling tired, shortness of breath or a poor capacity to exercise. On the other hand, the condition may show severe manifestations such as perplexity, loss of cognizance, or excessive thirst^[1]. Iron

is of great importance in human nutrition. Iron deficiency anemia is wide spread in the world^[2]. About 1.62 billion people are globally affected^[3]. Prevalence of anemia amongst women of reproductive age (15-49) was 51.40% as of 2016 in India. National Family Health Survey (NFHS) shows Madhya Pradesh registered 56 % anemia in reproductive age, which is 0.7% higher than national average. Almost 46.9% urban and 59.6% rural women population in state are

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DOI:

doi.org/10.5281/zenodo.10432341

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How to cite this article: Narwariya R & Choubey S. Effectiveness of Daily vs Weekly Iron Folic Acid Tablet Supplements Among Adolescent Girls: A Meta-Analysis. PJSR. 2023;16(2):38e.

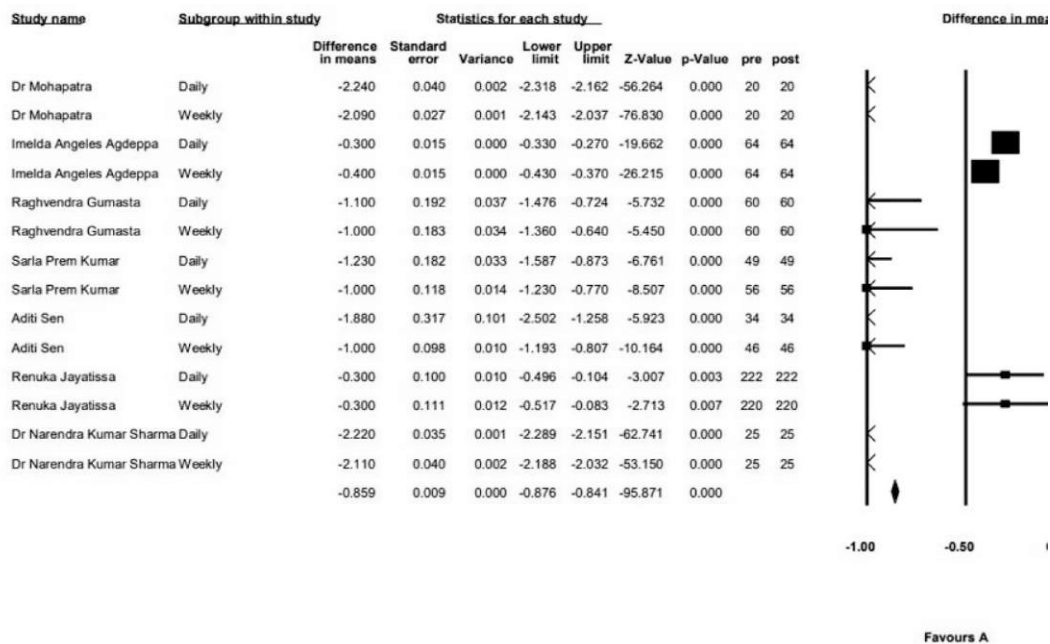


Table 1: Various studies showing weekly vs daily iron folic acid tablet supplementation on adolescent woman.

affected by anemia^[4]. Latest national level health survey has brought out a shocking fact. According to the survey, 80 % population in Madhya Pradesh, Uttar Pradesh, Rajasthan, Bihar were anemic. According to a study on anemia in adolescent school girls of Bhopal, prevalence was 58.4%. Poor dietary habits, blood loss in menstrual cycle, less consumption of iron rich source (green leafy vegetables and non-vegetarian diet) commonly cause iron deficiency anemia among adolescents. Thus, iron deficiency anemia can be prevented by providing adequate amount of iron supplements to the adolescent girls^[5]. Various government programs have been carried out to tackle this serious issue. The main aim of such programs is to decrease severity and prevalence of anemia in adolescents. Weekly Iron –Folic Acid Supplements of 100mg elemental iron and 500ug folic acid on a decided day are most commonly prescribed^[6]. The present meta-analysis was done to find out the whether daily dose or weekly dose is effective.

MATERIALS & METHODS:

The study was carried out in our institute and it had the necessary institutional ethical committee approval. Randomized Clinical Trials (RCTs) or controlled trials in adolescent girls comparing the effectiveness of daily versus weekly iron folic acid tablet supplements were chosen for the meta-analysis. The search was done from online search engines such as Pubmed, Medline, Embase, DELNET, CINAHL,

Citation Index, Cohort Library, Cochrane Central, Gray literature, published and unpublished manuscript sources and hand – searched journals from 1997 to 2019. Total 69 recorded through online database searching and 20 additional records through other sources were found. Only studies involving adolescent girls who were given iron-folic acid tablets on weekly versus daily basis were considered. Studies conducted on pregnant women, postnatal mothers, children and adolescent boys were excluded.

On the basis of our inclusion criteria only 7 studies qualified for the meta-analysis. The fixed effects model was used for analysis. Heterogeneity was determined using the I^2 statistic, in which numbers greater than 75% were suggestive of considerable heterogeneity and by p -value from the X^2 test. In cases of considerable heterogeneity, no pooled – effect estimates was provided.

RESULTS:

The meta-analysis is one of its kind that considered only adolescent women being treated with iron-folic acid tablets either daily or weekly. The meta-analysis done by the fixed effects model showed that out of 7 studies, 5 studies favored the daily iron folic acid tablet supplementation in comparison with only 2 studies that favored weekly iron folic acid tablet supplementation (Table 1). Hence, we can say that daily Iron folic acid tablet supplements are more effective for improving hemoglobin level among adolescent girls than weekly doses.

DISCUSSION:

UNICEF recommends iron folic acid tablet supplementation for all female between 10-49 years in countries where over 30% of the population is anemic^[7]. While this would put additional financial burden on the government, the benefits in future would far outweigh the expenditure incurred. Studies by Liu, et al.^[8] and Gross^[9] have suggested that a supplement given weekly twice or even once would be as effective as a daily supplement in raising hemoglobin levels. In such a case the cost of supplementation would also be cut to one third. However, our meta-analysis study showed that most of the studies conducted revealed that daily supplements are better.

We found out that supplementation with iron either daily or weekly twice brought about a significant increase in the hemoglobin levels of the subjects to some extent. and there was no significant difference between the increase brought about by both types of supplementations. At the end of 84 days of supplementation, the hemoglobin status of weekly twice-supplemented subjects was as good as daily supplemented subjects. As seen from the data, even for shorter periods of time this improvement holds good. When the total mean increment in hemoglobin was examined, the severely anemic subjects showed better results. It is observed that lower the initial hemoglobin level, the greater the need for increase on supplementation. It is a fact that the body dictates the amount of iron to be absorbed depending on its own iron status. Although our study was strictly on adolescent girls, similar studies need to be done on pregnant women, postnatal mothers, children and adolescent boys.

CONCLUSION:

Assessment of the effectiveness of weekly iron folic acid tablet supplement among adolescent girls is the main concept of the study. We concluded that there was minimal difference between daily and weekly iron folic acid tablet supplement.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Research Article

Assessment of breast-feeding experiences following a significant primary postpartum hemorrhage among primigravida mothers in Bhopal

Naziya Khan¹, Mousmi S Lendhe², Alok Rawat³

¹Department of Obstetrics and Gynecological Nursing, People's College of Nursing and Research Center, People's University, Bhopal, India, ²Department of Medical Surgical Nursing, People's College of Nursing and Research Center, People's University, Bhopal, India, ³Department of Community Health Nursing, Tanta University, Sri Ganganagar, India

ABSTRACT:

Background-Postpartum hemorrhage can trigger a series of events that prevent a mother from fully breastfeeding. To find out the factors brought about by postpartum hemorrhage which impact successful breastfeeding, 15 primigravida mothers were selected for the study.

Materials & Methods- The Mixed method research design was used in this study. The study population included primigravida mothers with a significant Postpartum hemorrhage (estimated blood loss of 1500 mL or more) in 24 hours. The study was done in a private hospital at Bhopal. The sampling technique used for this study was purposive sampling (non - probability).

Results- The findings showed a significant association between severity of blood loss and breastfeeding in the first postpartum week. After adjustment for method of birth and timing of the first opportunity to suckle, the association was statistically significant. The difficulties with breastfeeding may be due to delayed lactogenesis Stage II. In addition, early separation from their baby, their stressful birth experience, ongoing fatigue, and the physical sequelae of Postpartum hemorrhage were all cited by mother as factors influencing their inability to successfully breastfeed.

Conclusion- The observations reported here support that mothers are able to successfully breast-feed, but may find it difficult in complications related to PPH.

KEYWORDS: Breastfeeding, Postpartum hemorrhage, Primigravida Mothers.

Address for correspondence : Professor Naziya Khan, Department of Obstetrics and Gynecological Nursing, People's College of Nursing and Research Center, People's University, Bhopal, India, E-mail: naziyakhan.khan6@gmail.com

Submitted: 05.09.2023, **Accepted:** 21.11.2023, **Published:** 26.12.2023

INTRODUCTION:

Postpartum hemorrhage (PPH) can trigger a series of events that prevent a mother from fully breastfeeding.^[1] Additionally, mother and baby may be separated causing a delay in breastfeeding initiation. Maternal fatigue may also necessitate formula supplementation.^[2]

The incidence of maternal morbidity was 42.9% during puerperium. The postpartum morbidities

included breast problems (18.4%), secondary PPH (15.2%), puerperal genital infections (10.2%) and insomnia (7.4%). Frequent postpartum morbidity suggests the need for home based postpartum care in India.^[3]

According to a qualitative study on the breastfeeding experience of mothers of pre-term infants in the first 12 months, after birth 270 mothers provided 496 written answers through questionnaires

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How to cite this article: Khan N, Lendhe MS, Rawat A. Assessment of breast-feeding experiences following a significant primary postpartum hemorrhage among primigravida mothers in Bhopal. PJSR. 2023;16(2):41e.

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DOI:

doi.org/10.5281/zenodo.10432468

containing open-ended questions. Three organizing responses, namely, “navigating smoothly,” “navigating with a struggle” and “navigating in ambiguity” were revealed in the mother's narratives regarding their breastfeeding experiences. These organizing themes were further interpreted as one global theme that was deemed “A journey to finding one's unique way in breastfeeding.”

A study to assess the breast-feeding experience following a significant PPH among primigravida mothers in a selected hospital Bhopal was planned. The objectives of the Study were to find out the factors brought about by PPH which impact successful breastfeeding and to find the association between impact of breast feeding among primigravida mothers with their socio demographic variables.

MATERIALS & METHODS:

The study was carried out in a private hospital in Bhopal, India. Institutional ethical clearance was obtained. The study population included primigravida mothers with a significant PPH.

Mothers with a significant PPH defined as an estimated blood loss of 1500 mL or more in the 24 hours following childbirth, and/or a peripartum fall in haemoglobin (Hb) concentration to 7g/dL or less were included. Mothers aged less than 18 & multigravida mothers were excluded. Also mothers who were not willing to participate in the study, or if they experienced either a stillbirth or a neonatal death were not included. Purposive sampling (non - probability) technique were used to collect sample. 15 primigravida mothers formed the sample size. A carefully designed questionnaire was designed after consulting a team of 5 professionals.

The questionnaire consisted of 3 sections:-

Section A: Quantitative:

Socio demographic data. This section consisted of 5 items pertinent to the demographic data of the primigravida mothers such as age, parity, mode of delivery, number of days admitted in hospital and contact with baby.

Section B: comprised of 5 questions related to breast feeding and postpartum physical concerns.

Section C: Qualitative:

The questions in this section included responses in their own words related to questions on their experience during labour and birth or any other information or comments on hospital care.

Reliability of the questionnaire:

The split half method was used to test the reliability of

the questionnaire. The test was first divided in to two equivalent half and co-relation was found by using Cronbach's Alpha correlation of co-efficient formula. The reliability of the tool was 0.82. So, it was found to be reliable for data collection.

For Qualitative tools the reliability was done by triangulation method while the data collection was done by Expert, primi mothers, nursing students. The tool was found feasible and accepted after pilot study.

Data collection Procedure:

- Prior to the data collection, permission was obtained from the concerned hospitals authorities for conducting the study.
- Mothers were selected according to the selection criteria and they were assured of confidentiality.
- Written consent was obtained from the mothers.
- After complete medical records were obtained, three questionnaires were allotted; the first being complete questionnaire (includes Section A, B & C) within 24 hours after delivery and the second (Section C) and third (section C) at 5th Day after delivery and 10th postpartum day respectively.

Within 24 hours of delivery, the mothers were asked how they had hoped to feed their babies and their current feeding method. In addition, the mothers were asked about their babies' location in the 1st hour after delivery and subsequently, and how soon after birth they may have an opportunity to breastfeed their babies.

Section B-

At 5th day and 10th day postpartum, mothers were asked about their infant's current feeding method and to rate their baby's health (**anyone should be ticked**)

Fully breastfeeding

Complementary feeding

Bottle/formula feeding

This was followed by allotting (1= Poor, 2 = Fair, 3= Good, 4= Excellent) for their experience.

Also, the participants were asked to identify their postpartum physical concerns at 5th day and 10th day postpartum: (**anyone should be ticked**)

Not a problem

A minor problem

A major problem

Section C: In all three questionnaires, mothers were invited for open ended questions in response to the question:

- (a) Is there anything about your labour and birth that is bothering you now? At 5th day and 10th day of postpartum two additional questions were also included.
- (b) What other information, if any, have you found helpful?
- (c) Are there any other comments you would like to make about your care in hospital and since discharge?

DATA ANALYSIS:

Edinburgh Postnatal Depression Scale was used on 15 mothers, to give adequate precision ($\leq 5\%$) for the estimate of prevalence of the study outcome measure with the highest expected prevalence (score > 12 on the Edinburgh Postnatal Depression Scale).

Differences between unrelated proportions were tested by using Chi Squared test. McNemar's test was used to determine the significance of the difference between paired proportions.

The analysis was done by statistical level of significance at the 5% two-sided level.

For analysis of the qualitative data, mother's verbal comments were transcribed verbatim and analyzed for content and inductively coded to identify a thematic framework.

RESULTS:

Section A: In this section description of socio demographical variables was taken into consideration under the following headings.

- (a) Distribution of subject according to Parity, out of 15 women, 10 (66.6%) were primiparous, 5 (33.3%) women had a singleton birth.
- (b) The majority 10 (66.6%) were aged less than 35, with only 1 (6.66%) aged between 35 to 40 years while 4 (26.6%) participants were older than 40 years.
- (c) Overall, 4 (26.6%) women had a caesarean section.
- (d) 10 (66%) participants stayed for at least for 1 day or less than 24 hours while 5 (27%) stayed for 5 days.
- (e) Results for distribution of subjects according to early contact with baby revealed that out of 15 only in 3 (20%), the baby was given to the mother after first hour of birth for breast feed, 12 (80%) after 24 hours post birth the baby were given to mother for breast feed.

Section B: This section included quantitative questions.

As depicted in Table 1, 3(20%) mothers got chance to breast feed within 1/2hrs, whereas 5 (33.3%) said they had hoped to do so ($p < 0.001$). For 12 (80%) of the participants, the opportunity was delayed for more than 1 hour and this was for complicated pregnancies in 70% cases. Although not statistically significant, there was a trend towards increasing delays in the first opportunity to breastfeed as estimated blood loss increased ($p = 0.13$). Mothers who were able to give their baby the opportunity to suckle within two hours of birth were more likely to fully breastfeed at baseline ($p < 0.01$).

Table 1: Description of mothers according to timing of first opportunity to suckle for babies of mothers who intended to breastfeed.

Sl.No.	Score	Breast feeding timing	
		Frequency	Percentage
1.	Within 1/2hr	3	20%
2.	Within 1-2hrs	7	46.7%
3.	After 2-4hrs	5	33.3%

Table 2: comparison of estimated blood loss & initiation of breast-feeding timing.

Blood loss	Timing					
	½ hr		1 – 2 hr		2-4 hr	
<2000 ml	2	6.7%	2	20%	-	
2000 -2999ml	1	13.3%	4	26.6%	1	6.7%
More than 3000	-		1	6.7%	4	26.7%

Our results showed that among women intending to breastfeed, those with the higher estimated blood loss were less likely to fully breastfeed in the **first 5 postpartum days** than mother with lower estimated blood loss (Table 2 & Figure 1). In summary, just over 70% women with PPH of < 2000 mL were fully breastfeeding in the first 5 postpartum days, whereas less than 30% of those with blood loss ≥ 3000 mL were able to do so ($p = 0.01$). In our analysis, there was a marginally significant association between prior exposure of interest (estimated blood loss) and the likelihood of partially breastfeeding or bottle/formula feeding. Table Method of birth and timing of the first opportunity to suckle were co-linear and each of these exposures was significantly associated with the likelihood of partially breastfeeding or bottle/formula feeding. Adjusted comparison of feeding method and timing is depicted (Table 3 Figure 2) for prior exposure of interest adjusted for each of these exposures separately.

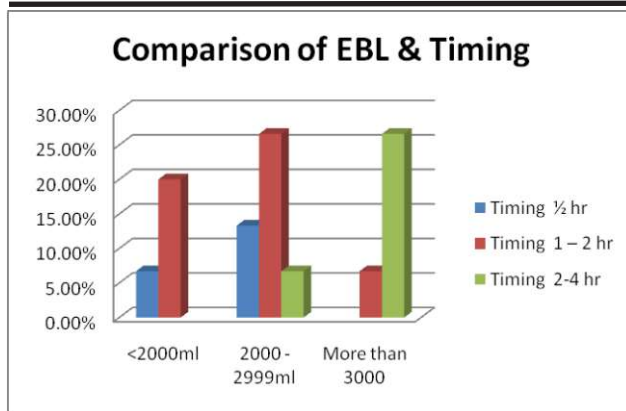


Figure 1: Graphical representation of Estimated blood loss (EBL) & initiation of breast-feeding timing.

Section C:

Table 3: Description of mothers according to their infant's current feeding method on 5th day and 10th day postpartum.

Sl.No	Score	Type of feeding	
		Frequency	Percentage
1.	Fully breastfeeding	2	13.4%
2.	Complementary feeding	8	53.3%
3.	Bottle/formula feeding	5	33.3%

Our results showed that the majority 8(53.3%) infant's current feeding method was complementary feeding on 5th day and 10th day postpartum [Table 3].

Table 4: Description of mothers according to their infant's current feeding method and feeding initiation timing on 5th and 10th postpartum day.

Feeding Method	Timing					
	1/2 hr		1-2 hr		2-4 hr	
Fully breastfeeding	1	6.7%	1	6.7%	-	-
Complementary feeding	2	13.3%	4	26.6%	2	13.3%
Bottle/formula feeding	-	-	1	6.7%	4	26.7%

Among women intending to breastfeed, those with the higher estimated blood loss were less likely to fully breastfeed in the *first postpartum* week than women with lower estimated blood loss (Table & 4 Figure 2). In summary, just over 70% women with PPH of < 2000 mL were fully breastfeeding in the first 5 days of postpartum period, whereas less than 30% of those with blood loss ≥ 3000 mL were able to do so ($p=0.01$). In our analysis, there was a marginally significant association between prior exposure of interest (estimated blood loss) and the likelihood of partially breastfeeding or bottle/formula feeding. Method of birth and timing of the first opportunity to suckle were

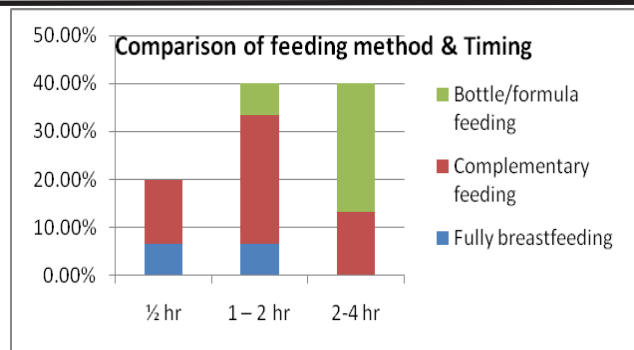


Figure 2: Graphical representations of Method of feeding and initiation of breast-feeding timing.

co-linear and each of these exposures was significantly associated with the likelihood of partially breastfeeding or bottle/formula feeding.

Overall, 13.4% of mothers with significant PPH were fully breastfeeding in the first postpartum day, 53% at two and 34% at 10th day postpartum. Stratifying the data by estimated blood loss, rates of full breastfeeding were lowest at all the time points for mothers with the highest estimated blood loss. There was some recovery in terms of reversion from partial to full breastfeeding by 10th day of postpartum among women in the intermediate category (more than 1500 mL), but not among those with greater estimated blood loss.

Table 5: Description of mothers according to their postpartum physical concerns on 5th day and 10th day postpartum.

Sl.No.	Score	physical concerns	
		Frequency	Percentage
1.	Not a problem	5	33.4%
2.	A minor problem	7	46.6%
3.	A major problem	3	20%

Our results showed that the majority 7(46.6%) mothers had minor problems on 5th day and 10th day postpartum.

Maternal perception of Baby health: At 10th day 10 (66.6%) mothers reported that breast pain and tenderness had been either a minor or major problems during feeding time. No association was found between estimated blood loss and risk problems.

Mastitis: At 10th day3 (20%) mothers reported that a breast infection or mastitis had been either a minor or major problem for them in the preceding days. No association was found between estimated blood loss and risk of problems with mastitis.

Analysis of mother's comments relating to breast feeding: 15 mothers included references to their breastfeeding experiences in their verbal comments in

the questionnaires.

Three major themes were identified: 1) Difficulty initiating or sustaining breastfeeding, 2) Need for education and support; and 3) Emotional sequelae.

1) Difficulty initiating or sustaining breastfeeding:

Mothers explained various factors that made initiating breast-feeding difficult. These included physical separation from the baby, fatigue, mobility and posture problems, and delayed milk production. One woman summed up her experience as:

"Breastfeeding was much harder than I thought and my delivery experience made it harder." (ID 4, primipara, 1500 mL blood loss, 5th day of postpartum).

One mother described her main concerns after the birth as:

Separation from baby one and a half hours after birth and for about three plus hours whilst in theatre. Delay with getting breastfeeding underway." (ID 7, primipara, 1500 mL blood loss, first day of postpartum).

One mother also wrote of insufficient and slow production of colostrum/milk as well as sheer inability to breastfeed "...due to no energy because of the PPH."

Reasons cited for ongoing breastfeeding difficulties or cessation included: complications such as mastitis and nipple pain, stress and inconvenience - particularly when the breast milk was expressed, and meeting the physical demands of breastfeeding while recovering from the PPH. Having mastitis or a breast abscess was reported variously as a reason for readmission to hospital, ongoing physical concerns and a cause of discomfort. In general, breast discomfort was a commonly cited problem along with "nipple damage and soreness" and "sore breasts".

One woman began supplementing with formula as she was suffering "deep pain in the breasts following a feed" and tender breasts. Other discomfort suffered included postural problems and "stiff/sore neck" due to tenseness during breastfeeding. With regard to the physical demands of both breastfeeding and recovering from the PPH, one participant wrote:

I feel that most of my problems health wise are due to breastfeeding and the effort that it takes both in time.....and in physical effort (strain on body). However I think the reality of my having "after birth bleeding" and losing so much blood was just that it took so much longer than normal (other mothers) to feel like I was normal." (ID 8, primipara, 1800 mL blood loss, 10th postpartum day).

2. Need for education and support: Mothers written

comments reinforced the importance of appropriate and timely support and advice for successful breastfeeding. The participants wrote mainly of their experiences with midwives; women who had a positive experience used words such as "help" and "information". One participant said that the midwife "ensured the baby was put to the breast as soon as possible". This was found to be "reassuring". Conversely, women who had negative experiences used words such as "unhelpful", citing reasons such as getting "mixed opinions" and "conflicting advice".

For example, one woman wrote in relation to attachment problems:

The midwives weren't very good with me trying to breastfeed. I had attachment problems and they made it worse. I had to consult a lactation specialist to help me." (ID 11, primipara, 2500 mL blood loss).

Not all advice given by healthcare providers was deemed helpful or was followed. One participant said she chose not to continue to take the analgesics she was prescribed. She said that as a result she *felt absolutely fantastic* and *"breastfeeding improved as the baby wasn't as drowsy."*

Issues of timely access to appropriate services were also raised. One participant wrote:

I would have found it helpful to have spent some time at the breastfeeding clinic or have been encouraged to do so."

Some things were mentioned which might have made a difference. For example, in one woman's words:

"...now it's bothering me that the doctors in hospital would just not listen to me about getting a blood transfusion earlier (I had a PPH previously with my first child) and my recovery and difficulties with breast feeding would have been so much better!"

3. Emotional sequelae

A number of mothers regret to express the emotional consequences of their inability to realise their goal of breastfeeding their babies. Some express the feeling of stress associated with breastfeeding. The stressors included expressing and supplementary feeding, as well as breastfeeding twins. One mother spoke of *"confusion and frustration"* associated with conflicting advice from postnatal midwives and another had "concerns about whether I can produce enough milk." Some mothers found breastfeeding difficult, especially when they had to express breast milk, which was referred to as *"inconvenient"* by one woman who persevered for 10th day, and *"tiring"* by another. Disappointment and regret was mentioned by mothers who had been unable to feed. The intensity of

this feeling varied; one mother expresses that:

I do sometimes wish I could have continued breastfeeding, but it just didn't work out." (ID 1 primipara, 2000 mL blood loss, 10th day postpartum).

Another was devastated and attributed her negative experience to the PPH:

My dream of breastfeeding has been shattered due to no energy because of the PPH so I have started feeling quite down. (ID 3, multipara, 1800 mL blood loss, 7day of postpartum).

Mothers discuss many factors that made initiating breastfeeding difficult. These included physical separation from the baby, fatigue, mobility and posture problems, and delayed milk production.

DISCUSSION:

The study was carried out in a private hospital in Bhopal. The study is one of its kind that describes issues in breast-feeding due to PPH. Our study showed breast-feeding outcomes in a group of mothers experiencing PPH. Despite experiencing a significant, and in some cases life threatening blood loss condition, mothers in this study achieved remarkably good rates of both initiation and duration of full breastfeeding. The findings showed that there was a significant association between severity of blood loss and breast-feeding in the first postpartum week (p -value 0.001) 1. After adjustment for method of delivery and timing of the first opportunity to suckle, the association was statistically significant.

Consistent with the quantitative results, qualitative data indicate that difficulties with breast-feeding may be due to delayed lactogenesis Stage II in this population, with mothers reporting delays in onset of milk secretion. In addition, early separation from their baby, their stressful birth experience, ongoing fatigue and the physical sequelae of PPH were all cited by mothers as factors influencing their inability to successfully breastfeed. The qualitative data are also consistent with the concept that inability to successfully breastfeed is not benign and has emotional sequelae including disappointment, loss, regret and sense of failure. Mother's accounts of their breastfeeding experiences also highlight the crucial role of health care providers in supporting women to breastfeed, in particular, providing them with adequate information, reassurance and practical advice.

Our results were consistent with various studies. Finding is supported by, a descriptive study based on quantitative and qualitative data collected via questionnaires completed in the first week postpartum and at two and four months postpartum, by 206 women participating in a multicentre study of women's

experiences of a significant primary PPH (blood loss of 1500 mL or more in the 24 hours following childbirth, and/or a peripartum fall in haemoglobin (Hb) concentration to 7g/dL or less, or of ≥ 4 g/dL). In the first postpartum week, 63% were fully breastfeeding their babies and by four months postpartum 45% continued. Further, maternal ratings of infant health at both two and four months were high, with over 95% rating their infant's health as excellent or good at both time points.^[2,3,4]

The findings of the present study have implications in the field of **Nursing Education**. This study implies that antenatal mothers have to be trained well on how to take care of new born and make them aware about breast-feeding and postnatal care. Nurses need to be made aware that family participation is an important aspect of care. Continuing nursing education should be conducted for need awareness.

Independent **nursing practice** is one of the evolving trends in which definite specified roles of nurse clinician, nurse practitioner etc are emerging. Our study can contribute to the development of a new specialization itself in nursing. Nurses as primary care givers have the supreme responsibility in prevention of PPH.

Nursing administrators may involve in policy making and budgeting for health programmes and also formulate policies that will include all nursing staff to be actively involved in health education programmes in their respective hospital and community.

Professional organizations in nursing are convinced of the importance of **nursing research** as a major contribution to meeting the health and welfare needs of the people. The present study is only an initial investigation in the area of teaching regarding management of PPH and importance breast feeding.

CONCLUSION:

The purpose of this study was to investigate the effect of PPH on successful breast-feeding. The observations reported here support that mothers are able to successfully breast-feed, but may find it difficult in complications related to PPH. Mother with greater blood losses are more likely to be adversely affected and this may be related, in part, to delays in initial contact with their baby as a consequence of the PPH.

Maternal health services should identify the risk and address modifiable factors that hinder the ability of women with PPH to successfully initiate and sustain full breast-feeding and recognize and treat delayed or failed lactogenesis Stage II where necessary.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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Review Article

Use of Artificial Intelligence in detecting various kinds of oral ulcers

Anushree Rathore¹, Amruta Vaidya², Karri Tyson¹, Abhishek Gupta³

¹Department of Oral Pathology and Microbiology, Bhabha College of Dental Sciences, Bhopal, India,

²Department of Conservative Dentistry and Endodontics, Bhabha College of Dental Sciences, Bhopal, India, ³Department of Public Health Dentistry, Bhabha College of Dental Sciences, Bhopal, India

ABSTRACT:

The integration of Artificial intelligence in the detection of mouth ulcers marks a transformative advancement in oral healthcare. This review explores the multifaceted benefits of Artificial intelligence in this context, emphasizing its role in expediting diagnosis, enhancing accuracy, and fostering proactive interventions. The ability of Artificial intelligence to analyze oral images rapidly and precisely enables early detection and classification of various mouth ulcers, contributing to more informed treatment plans. The technological pattern recognition capabilities and its integration with imaging techniques offer a comprehensive understanding of oral health, facilitating differentiation between ulcer types. Real-time monitoring empowers patients and healthcare providers, promoting timely interventions and self-awareness. While Artificial intelligence holds promise for preventive strategies and resource optimization, responsible implementation and ethical considerations are crucial. The review concludes that Artificial intelligence in mouth ulcer detection signifies a paradigm shift towards more efficient, precise, and patient-centric oral healthcare practices.

KEYWORDS: Artificial Intelligence, mouth ulcers, oral ulcer, dentistry, ulcer

Address for correspondence : Dr Anushree Rathore, Reader, Department of Oral Pathology and Microbiology, Bhabha College of Dental Sciences, Bhopal, India. E-mail: anushreerahulsingh@gmail.com

Submitted: 26.08.2023, **Accepted:** 12.11.2023, **Published:** 26.12.2023

MOUTH ULCERS-

Mouth ulcers, also known as canker sores, occur as different types. The most common ones include minor ulcers, major ulcers and herpetiform ulcers. Minor ulcers are small, round, or oval-shaped ulcers with a white or yellowish center and a red border. They are the most common type and usually heal within 1 to 2 weeks. Major ulcers are larger and deeper than minor ulcers, with a more defined border. They can be quite painful and may take several weeks to heal, often leaving a scar. Herpetiform ulcers despite the name, are not caused by the herpes virus. They are small, pinpoint-sized ulcers that often appear in clusters of 10 to 100. Despite their size, they can be very painful^[1]. It's worth

noting that there are other conditions that can cause ulcer-like sores in the mouth, such as viral infections, autoimmune diseases or trauma^[2,3]. The ulcers caused by persistent chronic trauma are called traumatic ulcers. If you're dealing with persistent or severe ulcers, it's a good idea to consult with a healthcare professional for proper diagnosis and treatment.

ARTIFICIAL INTELLIGENCE:

Artificial Intelligence (AI) is making its way into various fields, and dentistry is no exception. Here are some ways AI is being utilized in dentistry. i) **Diagnosis and Imaging:** AI can assist in the analysis of

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doi.org/10.5281/zenodo.10432487

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How to cite this article: Rathore A, Vaidya A, Tyson K, Gupta A. Use of Artificial Intelligence in detecting various kinds of oral ulcers. PJSR. 2023;16(2):48e

dental images, including X-rays and scans. It helps in identifying issues like cavities, bone loss, and other abnormalities more accurately and quickly than traditional methods. ii) Treatment Planning: AI algorithms can analyze patient data to aid in treatment planning. They can suggest personalized treatment options based on the patient's history, preferences, and specific dental conditions. iii) Robotic Dentistry: Robots equipped with AI capabilities can perform certain dental procedures with precision. They can assist in tasks like tooth drilling and implant placement, enhancing the accuracy of these procedures. iv) Patient Management and Communication: AI-powered chatbots and virtual assistants can handle appointment scheduling, answer patient queries, and provide information on post-treatment care. This improves overall patient management and communication.^[4] v) Predictive Analytics: AI can analyze patient data to predict oral health trends and potential issues. This proactive approach allows dentists to intervene early, preventing the progression of certain dental conditions. vi) Virtual Consultations: AI facilitates virtual consultations, allowing patients to interact with dentists remotely. This is especially useful for follow-ups, initial assessments, and consultations for minor issues. vii) Training and Education: AI can be used in dental education by providing simulations, virtual reality experiences, and interactive learning modules. This enhances the training of dental students and professionals. viii) Data Security and Privacy: AI plays a role in enhancing the security of patient data. It helps in monitoring and identifying potential breaches, ensuring that sensitive patient information is protected. While AI brings several benefits to dentistry, it's important to note that it doesn't replace the expertise of dental professionals. Instead, it serves as a valuable tool to enhance diagnostics, treatment planning, and overall patient care^[4,5].

ROLE IN DETECTING MOUTH ULCERS:

AI has shown promise in the detection and diagnosis of mouth ulcers, offering improvements in accuracy and efficiency. Here's how AI can be applied in this context;

- (a) Image Analysis: AI algorithms can analyze images of the oral cavity, including photographs or scans, to detect and classify different types of mouth ulcers.⁵ This can aid in

early diagnosis and appropriate treatment.

- (b) Pattern Recognition: AI can be trained to recognize patterns associated with various oral conditions, including different stages of mouth ulcers. This pattern recognition helps in distinguishing between normal variations and pathological conditions.
- (c) Diagnostic Assistance: AI-powered diagnostic tools can assist healthcare professionals in identifying and characterizing mouth ulcers. By providing quick and reliable assessments, AI can support dentists and oral health specialists in making more informed decisions.
- (d) Integration with Imaging Techniques: AI can enhance the analysis of imaging techniques commonly used in dentistry, such as dental X-rays or 3D scans. By identifying subtle changes or abnormalities, AI contributes to the early detection of mouth ulcers^[6].
- (e) Data Mining and Analysis: AI can process large datasets, including patient records, medical histories, and images, to identify trends and potential risk factors for mouth ulcers. This can aid in understanding the underlying causes and improving preventive strategies^[5,6].
- (f) Real-time Monitoring: AI applications can offer real-time monitoring of oral health conditions. Patients using mobile apps or wearable devices equipped with AI algorithms can receive immediate feedback on the presence of mouth ulcers, promoting timely intervention.
- (g) Telemedicine Support: In telemedicine settings, AI can assist in remote assessments of oral health. Patients can use AI-powered tools to capture images of their oral cavity, and the AI system can provide preliminary assessments or recommendations for further evaluation^[5].
- (h) Accuracy in Differential Diagnosis: AI can help differentiate between different types of mouth ulcers, such as canker sores, viral ulcers, or ulcers associated with autoimmune conditions. This precision is valuable for tailoring treatment plans to specific ulcer types. AI can be used for detection whereas applications like Chat GPT can be used in dissemination of results in an understandable format^[6].

The integration of AI in the detection of mouth ulcers not only improves diagnostic capabilities but also supports more efficient and personalized healthcare. As with any medical application, collaboration between AI systems and healthcare professionals is crucial to ensure accurate and reliable results. With the use of AI, mouth ulcers can be effectively diagnosed and can help the dentists who are serving in underserved locations, prisons etc. where resources are limited, and specialists are also not available.^[7] Although when implementing the use of AI in underserved locations and prisons, ethical considerations, privacy, and security must be carefully addressed to ensure that the technology is used responsibly and in the best interests of the under-advantaged population's wellbeing or inmates' wellbeing^[8].

In conclusion, the integration of AI in the detection of mouth ulcers represents a transformative step toward more efficient, accurate, and proactive oral healthcare. The benefits of employing AI in this context are multifaceted. AI facilitates rapid and precise analysis of oral images, aiding in the early detection and classification of various types of mouth ulcers. This not only expedites the diagnostic process but also enhances the overall accuracy of identifying specific conditions. Technology's ability to recognize patterns and subtle changes in imaging techniques, such as X-rays or scans, contributes to a more comprehensive understanding of oral health. By differentiating between different types of mouth ulcers, AI supports healthcare professionals in tailoring treatment plans and interventions more effectively^[9,10].

Moreover, the real-time monitoring capabilities of AI empower both patients and healthcare providers. Patients can receive immediate feedback on the presence of mouth ulcers, promoting timely intervention and self-awareness. Healthcare professionals, in turn, benefit from improved diagnostic assistance and a data-driven approach to treatment planning. As AI continues to evolve, its role in oral diagnosis extends beyond detection—it plays a crucial part in advancing preventive strategies, optimizing resource allocation, and contributing to the overall improvement of oral healthcare systems.

However, it's important to approach the integration of AI in mouth ulcer detection with a balance of enthusiasm and caution. Responsible implementation, ethical considerations, and collaboration between AI systems and healthcare professionals are paramount to ensuring that the

technology enhances patient care while maintaining the human touch in healthcare. In essence, the use of AI in the detection of mouth ulcers signifies a promising paradigm shift, promising more efficient, precise, and patient-centric oral healthcare practices.

Financial Support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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